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TECHNICAL WHITE PAPER 2: ASSESSMENT OF FOCAL SPECIES CONSERVATION FOR THE CITY OF SAN DIEGO VERNAL POOL HABITAT CONSERVATION PLAN

Prepared for:

San Diego Association of Governments
401 B Street, Suite 800
San Diego, California 92101
Phone: (619) 699-1951

Prepared by:

AECOM
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454

Primary Authors
Lindsey Cavallaro, Scott McMillan,
Tom Oberbauer, and Linnea Spears-Lebrun

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INTRODUCTION

1.1 PROJECT BACKGROUND

The San Diego Association of Governments (SANDAG) will prepare a Vernal Pool Habitat Conservation Plan (HCP) for the City of San Diego (City) largely based on information contained in a series of Technical White Papers (TWPs). The Planning Area for the HCP is the geographical extent of land that will be included in the HCP and for which the protections provided under the HCP are afforded to the seven focal species. For the City's HCP, these lands include the entire jurisdictional boundaries of the City and three areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County. The Planning Area's extent is, by design, the area covered by the City's Multiple Species Conservation Program (MSCP); however, the HCP is a separate but compatible conservation plan for vernal pools and seven endangered focal species not covered under the City's MSCP.

Many lands included in the Planning Area are not under the local land use jurisdiction of the City. These lands could include special districts such as school districts, military lands, other federal properties, and state lands. These lands not under the land use jurisdiction of the City are included in the HCP for the purpose of conservation analysis. However, the regulatory requirements of the HCP will not be applicable. If land ownership is transferred and comes under City jurisdiction, or if the owner voluntarily requests inclusion, the HCP regulatory requirements will be applied after undergoing the appropriate amendment process as outlined within the HCP.

The TWPs focus on seven target vernal pool species consisting of five plants and two crustaceans:

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)

The eight TWP topics are as follows:

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWP 3: Development of Adaptive Management Strategy
- TWP 4: Development of Monitoring Strategy
- TWP 5: Property Analysis Record
- TWP 6: Recommendations for Conditions of Coverage
- TWP 7: Conservation Analysis
- TWP 8: Preserve Management Funding Mechanisms

This is TWP 2. It provides an analysis of the conservation of the seven focal species within the City's proposed Vernal Pool HCP Preserve (Preserve), as well as two alternative Preserve boundaries. The goal of the analysis is to compare the conservation provided to the focal species by each alternative Preserve boundary, as well as identify the gaps in conservation of each alternative. Those complexes not included in each alternative (a conservation gap) are analyzed for occupancy by the focal species and for importance to the recovery of the focal species as identified in the Recovery Plan (USFWS 1998).

The three alternatives are generally described as follows:

- Project: This alternative represents the proposed Project under the City's Vernal Pool HCP Preserve. It includes the Baseline area (Alternative 1, below) plus additional lands outside the Baseline planned for conservation. Approximately 63,169 acres of land in discontiguous parcels from the Mexican border to Lake Hodges would be in this Preserve.

- Alternative 1 – Baseline: This alternative is the baseline for vernal pool conservation. It includes existing conserved lands within the City's adopted Multi-Habitat Planning Area (MHPA). Approximately 62,760 acres are in the same geography with less area would be preserved in the Otay Mesa and Peñasquitos Canyon areas.

- Alternative 2 – Expanded Conservation: This approximately 63,540-acre alternative represents the Project plus conservation of additional vernal pools to protect additional focal species populations. These additional pools would be located generally on vernal pool complexes on Del Mar mesa and Otay Mesa.

Figure 1-1 illustrates the boundaries of each of the three alternatives. It should be noted that the Project and alternatives include primarily lands within City jurisdiction and areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County (Figure 1-1).

1.2 OVERVIEW OF HCP PLANNING AREA AND TWP 2 AREA OF CONSERVATION ANALYSIS

Table 1-1 below categorizes the various locations of vernal pools within the overall Planning Area for the City's vernal pool HCP process and provides the number of known vernal pools within each location. The Planning Area includes lands within the City's jurisdictional boundary plus other lands the City owns, such as Water District properties. There are 7,975 known vernal pools within the overall Planning Area. Those pools in military, state, or other federal ownership, plus other special districts, are not included in the Preserve because the City does not have jurisdiction over these lands. Of the 4,943 vernal pools on lands not included in the Preserve, 4,807 are located on Marine Corps Air Station Miramar. The area of analysis in TWP 2 includes lands under the City's jurisdiction that are both inside and outside of the vernal pool HCP Preserve. As shown in Table 1-1, the area of conservation analysis for TWP 2 (highlighted in grey in the table) includes 2,562 vernal pools. The analysis evaluates conservation for the Project and the two alternatives based on the 2,562 pools and associated focal species. It should be noted that existing conserved lands are located within the vernal pool HCP Preserve that are not subject to City jurisdiction. These lands include 470 vernal pools (and associated focal vernal pool species). However, these 470 pools are not included in this conservation analysis because the City's land use jurisdiction does not apply to these areas;, therefore, the lands cannot be made subject to the requirements of the HCP.

1.3 CONSERVATION ASSESSMENT OVERVIEW

A discussion of the results of the conservation analysis for each of the alternatives relative to the seven focal species is provided in Chapter 2.0. Not only is each preserve boundary alternative different in size, but within the boundary are areas with different percent conservation levels that include 75%, 94%, and 100%. The conservation level denotes the percentage of an area that would be conserved within the Preserve. For example, if a 100-acre parcel is designated with a 94% conservation level, then 94 acres would be conserved within that parcel. The remaining 6 acres would be available for development. For this conservation analysis, conservation of vernal pools and focal species is evaluated based on the percent conservation level or levels assigned to a complex. This means that if a complex (or portion of a complex) has 100 vernal pools designated as 94% conserved, it is assumed that 94 of the 100 vernal pools would be conserved.

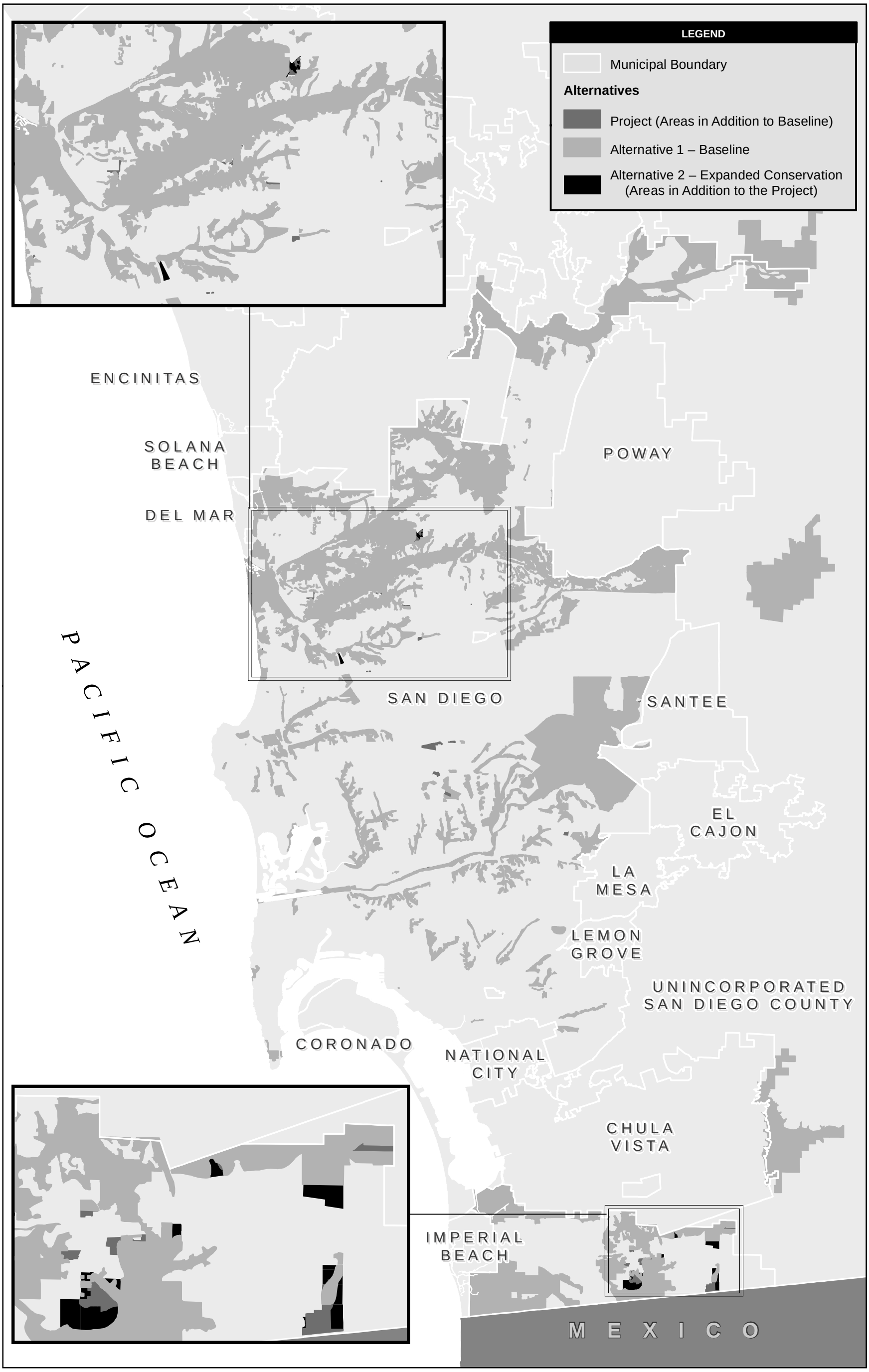
Table 1-1
Number of Vernal Pools within City Vernal Pool HCP Planning Area

Planning Area Category	Definition	Number of Pools		
Overall Planning Area (Total of A through D below)	Lands subject to City jurisdiction and areas not subject to City jurisdiction. Includes Lands Not Included plus Lands Inside and Outside the Vernal Pool HCP Preserve.	7,975		
A) Lands Not Included	Military, state, and federal lands, and special district properties such as school districts that are not within City jurisdiction.	4,943 (4,807 are vernal pools on Marine Corps Air Station Miramar, data is confidential)		
B) Inside of the Vernal Pool HCP Preserve Outside of City's Jurisdiction	Lands not under the City's jurisdiction that will not be subject to the regulations of the City's Vernal Pool HCP.	470		
C) Inside of the Vernal Pool HCP Preserve under City's Jurisdiction*	Lands under the City's jurisdiction that area proposed to be adopted in the Preserve under the City's Vernal Pool HCP.	Project	Alt 1	Alt 2
		2,420	1,874	2,454
D) Outside the Vernal Pool HCP Preserve under City's Jurisdiction*	Outside the Preserve but under the City's jurisdiction.	Project	Alt 1	Alt 2
		142	688	108
Total Pools Evaluated in Conservation Analysis (C+D)		**2,562**	**2,562**	**2,562**

*The rows shaded in grey indicate the pools subject to the conservation analysis in TWP 2; these categories total 2,562 pools.

The following information is provided by vernal pool complex for the 2,562 vernal pools within the area of conservation analysis:

- Conservation level (i.e., percent of conservation of a vernal pool complex). Note that some vernal pool complexes that occur on multiple parcels may have multiple percent conservation levels. For example, one portion of a complex may be 100% conserved, and another portion may be 75% conserved. If a complex is 75% conserved, it is assumed that 75% of the vernal pools and associated focal species populations within that area are conserved.
- Number and total surface area of pools conserved, based on the percent conservation level, as well as number and surface area of pools on private and public lands.
- Presence of U.S. Fish and Wildlife Service's (USFWS) critical habitat within a conserved complex.



Source: SANDAG 2011; SanGIS 2011

3.5 1.75 0 3.5 Miles

Scale: 1:221,760; 1 inch = 3.5 miles

Figure 1-1
Vernal Pool HCP Conservation Boundary Alternatives

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USFWS defines critical habitat as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery. Within the area of conservation analysis, critical habitat is identified for three of the seven focal species: spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp.

Conservation for each focal species consistent with the UUSFWS Recovery Plan for Vernal Pools of Southern California (Recovery Plan) (USFWS 1998) is also evaluated. The Recovery Plan calls for conservation of specific vernal pool complexes to maintain habitat function and species viability to achieve two purposes:

(1) maintain genetic diversity and population stability of the listed species, and/or

(2) reclassify the listed species down from "endangered" to "threatened" status or from "threatened" to delisting the species.

Gaps in conservation (i.e., where important focal species populations and/or key vernal pools are outside the Preserve and, therefore, not conserved) are also discussed for each alternative.

Chapter 3.0 offers a discussion on the potential benefits of acquiring additional lands with focal species populations for conservation versus performing restoration of habitat within existing conserved lands to stabilize and/or enhance focal species populations.

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CHAPTER 2
CONSERVATION ASSESSMENT

2.1 SUMMARY OF ASSESSMENT RESULTS

Attachment A includes tables with the detailed conservation assessment results for each alternative. The tables are organized to display conservation information by vernal pool complex.[1] The following chapter provides a summary and discussion of the analysis results.

Table 2-1 summarizes the vernal pool and focal species conservation provided by each of the three alternatives, including a comparison of the total number and total surface area of vernal pools conserved on both private and public lands, as well as the percentage of focal species populations conserved. Overall, Alternative 2 (Expanded Conservation) would provide the most coverage for both vernal pools (92.8% conserved) and individual focal species. The Project would provide slightly less coverage for vernal pools (91.6% conserved) compared to Alternative 2, with 32 (1.3%) fewer vernal pools conserved. Alternative 1 (Baseline) would provide the least amount of coverage for vernal pools (72.1% conserved), with 499 (19.5%) and 531 (20.7%) fewer conserved pools than the proposed Project and Alternative 2, respectively.

With regard to the seven focal species, all three alternatives would provide the same level of coverage for the Otay Mesa mint (100%), spreading navarretia (99.0%), and California Orcutt grass (100.0%) populations within the area of conservation analysis. As shown in Table 2-1, the proposed Project and Alternative 2 would provide the same level of coverage for the San Diego mesa mint and Riverside fairy shrimp, and nearly the same level of coverage for the San Diego button celery and San Diego fairy shrimp. Alternative 1 would provide a lower level of coverage for these four species compared to both the Project and Alternative 2.

[1] Vernal pool complexes may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Typically the pools in a complex are connected through the landscape, including the supporting watershed and upland habitats. These vernal pool complexes were given identification numbers by Bauder (1986). The numbers were updated by the City of San Diego's Vernal Pool Inventory (2004) and again updated by SANDAG (2011).

Table 2-1
Summary of Vernal Pool and Focal Species Conservation by Alternative
(Area of Conservation Analysis Equals 2,562 Total Pools)

Alternative	Number of Pools within Vernal Pool HCP Preserve under City's Jurisdiction	Number of Pools Conserved Based on Conser-vation Level	Vernal Pools Conserved (%)	Total SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number of Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land (Acres)	Total Popu1ation Conserved in Area of Conservation Analysis (%)*						
									PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS
Project	2,420	2,346	91.6	35.5	1,006	15.0	1,414	22.0	100.0	97.2	99.0	99.1	100.0	99.3	89.3
Alternative 1 – Baseline	1,874	1,847	72.1	28.4	605	9.2	1,269	20.3	100.0	80.1	99.0	94.2	100.0	97.2	83.6
Alternative 2 – Expanded Conservation	2,454	2,378	92.8	35.7	1,038	15.2	1,418	22.8	100.0	97.2	99.0	99.3	100.0	99.3	89.8

Note: Pools, total surface area, and species population conserved is based on 75%, 94%, and/or 100% conservation level by vernal pool complex. See Attachment A for more information.

SA= surface area
PONU = Otay Mesa mint
POAB = San Diego Mesa mint
NAFO = Spreading navarretia
ERAR = San Diego button-celery
ORCA = California Orcutt grass
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-2 provides a summary comparison of the number of conserved complexes with critical habitat in each of the three alternatives. As shown, the Project, Alternative 1, and Alternative 2 would conserved the same number of complexes with critical habitat for all three species (spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp). Information on critical habitat conservation by complex is provided in the tables in Attachment A.

Table 2-2
Number of Complexes with Critical Habitat

Alternative	Complexes with NAFO Critical Habitat	Complexes with Proposed RFS Critical Habitat	Complexes with SDFS Critical Habitat
Project	14	14	23
Alternative 1 – Baseline	14	14	23
Alternative 2 – Expanded Conservation	14	14	23

NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-3 summarizes the total acres of critical habitat that are conserved within each conservation level (75%, 94%, of 100%) for each alternative. As shown, Alternative 2 would conserve the most acres of critical habitat for all three species. Alternative 1 would conserve the fewest acres of critical habitat for all three species.

Table 2-3
Acres of Critical Habitat Conserved by Conservation Level*

Alternative	% Conservation Level	NAFO Critical Habitat (Conserved Acres)*	RFS Critical Habitat (Conserved Acres) *	NAFO Critical Habitat (Conserved Acres) *
Project	75	4.9	161.6	253.7
	94	40.7	0.0	138.7
	100	529.7	562.7	1,083.0
	Total	**575.3**	**724.3**	**1,475.4**
Alternative 1 - Baseline	75	3.1	161.6	188.9
	94	40.7	0.0	142.2
	100	473.1	476.4	955.7
	Total	**516.9**	**638.0**	**1,286.8**
Alternative 2 – Expanded Conservation	75	26.3	168.1	361.1
	94	40.7	0.0	138.7
	100	529.7	616.0	1,113.0
	Total	**596.7**	**784.1**	**1,612.8**

*Conserved acres equals the total acres multiplies by the conservation level %
NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

2.2 CONSERVATION GAP ANALYSIS

This section includes a table for each alternative summarizing the gaps in conservation under the proposed Project and two alternatives for the seven focal species by complex. Complexes identified in the Recovery Plan as necessary to stabilize or reclassify a focal species population that would not be fully conserved under each alternative boundary are also evaluated.

2.2.1 Proposed Project

Under the Project, 15 complexes within the area of conservation analysis would not be fully conserved, as summarized in Table 2-4. A total of 142 pools would be outside of the Preserve (i.e., 0% conservation level), including one pool with spreading navarretia, five pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 43 pools with San Diego fairy shrimp. Six of the 15 complexes not fully conserved under the Project are identified in the Recovery Plan as necessary to stabilize one or more of the focal species.

2.2.2 Alternative 1 – Baseline

Alternative 1 (Baseline) represents the lowest level of conservation of the three alternatives. As shown in Table 2-5, under Alternative 1, 30 complexes within the area of conservation analysis would not be fully conserved. A total of 688 pools would be outside the Preserve, including 53 pools with San Diego mesa mint, one pool with spreading navarretia, 38 pools with San Diego button-celery, four pools with Riverside fairy shrimp, and 79 pools with San Diego fairy shrimp. Compared to the Project, 15 additional complexes would not be fully conserved, with an additional 546 vernal pools that would not be conserved. Of the 30 complexes with unconserved pools, 13 are considered by the Recovery Plan as necessary to stabilize one or more of the focal species. In addition, five of the complexes that are not fully conserved are considered by the Recovery Plan as necessary to reclassify the focal species.

2.2.3 Alternative 2 – Expanded Conservation

Alternative 2 has the highest level of conservation of the three alternatives. Compared to the Project, Alternative 2 would result in 13 complexes within the area of conservation analysis that are not fully conserved as shown in Table 2-6. A total of 108 pools would not be conserved (compared to 142 under the Project), including one pool with spreading navarretia, three pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 40 pools with San Diego fairy shrimp. Compared to the Project, Alternative 2 would conserve two more pools with San Diego button-celery and three more pools with San Diego fairy shrimp. Five of the 13 complexes not fully conserved under Alternative 2 are identified in the Recovery Plan as necessary to stabilize one or more of the focal species.

Table 2-4
Summary of Conservation Gap Analysis for the Project

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
H 1-15	North	Del Mar Mesa	3								ERAR, POAB, SDFS	None identified
		Rhodes	11								ERAR, POAB, SDFS	None identified
I 12	North	Pueblo Lands North	4							3	None identified	None identified
J 13 E	South	South Otay J 13E	3				1				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay 1 acre	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4				1			2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay J 13S	13								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	6								None identified	None identified
J 34	South	Bachman	10							1	None identified	None identified
		Candlelight	18						1	13	None identified	None identified
J 35	South	Brown Field	25				1			3	None identified	None identified
		Brown Field Basins	2								None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
N 5-6	Central	Montgomery Field	13							7	POAB, NAFO, SDFS	None identified

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
OO	North	Salk Institute	1								None identified	None identified
Q 3	North	Castlerock	4							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
U 19	Central	Cubic (U19)	1								None identified	None identified
TOTAL			**142**			**1**	**5**		**1**	**43**		

[1] The total number of pools not within the Preserve represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis. See Attachment A for additional information.
PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

Table 2-5
Summary of Conservation Gap Analysis for Alternative 1 – Baseline

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
B 5-6	North	Tierra Alta	**1**								ERAR, POAB, SDFS	None identified
B 5-8	North	Crescent Heights	**7**								ERAR, POAB, SDFS	None identified
C 10-16	North	Winterwood	14		**2**					**1**	ERAR, POAB, SDFS	None identified
C 27	North	Mira Mesa Market Center	1		**1**					**1**	None identified	None identified
F 16-17	North	Menlo KM Parcel	13							1	None identified	None identified
H 1-15	North	Del Mar Mesa	4								ERAR, POAB, SDFS	None identified
	North	Rhodes	152		**7**		**6**			**4**	ERAR, POAB, SDFS	None identified
H 33	North	East Ocean Air Drive	2				2				ERAR, POAB, SDFS	None identified
I 1	North	Arjons	34		22		15			1	None identified	ERAR, POAB
I 12	North	Pueblo Lands	4							4	None identified	None identified
I 6 C	North	Bob Baker (Facilities Development)	15		7		2				None identified	ERAR, POAB
I 6 B	North	Bob Baker (Ford Leasing)	8		11						None identified	ERAR, POAB
J 13E	South	South Otay J 13E	6				1				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay 1 acre	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
J 13 S	South	Bachman	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	NDU 1 & 2	4							2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13S	36				7				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13E	3									
J14	South	Anderprises	24								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	Brown Field Basins	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	23						2	1	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 20-21	South	La Media ITS	33							6	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J21	South	La Media Swale South	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 31	South	Dennery West	1								None identified	None identified

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
J 34	South	Bachman	13							1	None identified	None identified
	South	Candlelight	27						2	13	None identified	None identified
J 35	South	Brown Field	27				1			3	None identified	None identified
	South	Brown Field Basins	2								None identified	None identified
J 36	South	Southview	10							7	None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
KK 2	Central	Pasatiempo	10								None identified	None identified
N 1-4, N 5-6	Central	Teledyne Ryan	43		1					11	POAB, NAFO, SDFS	None identified
N 5-6	Central	Montgomery Field	52							7	POAB, NAFO, SDFS	None identified
OO	North	Salk Institute	15								None identified	None identified
Q3	North	Castlerock	9							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
	Central	Sander	38		1					2	None identified	ERAR, POAB, ORCA, SDFS
U 19	Central	Cubic (U19)	24		1		2				None identified	ERAR, POAB, ORCA, SDFS
TOTAL			**688**	**0**	**53**	**1**	**38**	**0**	**4**	**79**		

[1] The total number of pools not conserved represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

Table 2-6
Summary of Conservation Gap Analysis for Alternative 2 – Expanded Conservation

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[2]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
H 1-15	North	Del Mar Mesa	1								ERAR, POAB, SDFS	None identified
		Rhodes	6								ERAR, POAB, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay 1 acre	1								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4							2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay J 13S	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	1								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	6								None identified	None identified
J 34	South	Bachman	10							1	None identified	None identified
		Candlelight	18						1	13	None identified	None identified
J 35	South	Brown Field	25				1			3	None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
N 5-6	Central	Montgomery Field	13								POAB, NAFO, SDFS	None identified

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[2]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
OO	North	Salk Institute	1							7	None identified	None identified
Q 3	North	Castlerock	4							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
U 19	Central	Cubic (U19)	1								None identified	None identified
TOTAL			**108**			**1**	**3**		**1**	**40**		

[1] The total number of pools not conserved represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

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CHAPTER 3
DISCUSSION OF CONSERVATION VERSUS RESTORATION

The recovery strategy for the listed vernal pool species in the USFWS Recovery Plan focuses primarily on reducing and/or eliminating the primary existing threats to vernal pool habitat, specifically habitat destruction and modification, alteration of hydrology and watershed area, and competition from nonnative species. The required efforts to recover the focal vernal pool species identified in the City's HCP involves both conservation and restoration. USFWS defines conservation as the stabilization of the populations through habitat procurement and management, while restoration is the stabilization, enhancement, and expansion of existing vernal pool habitat through active habitat restoration and management (USFWS 1998).

This section describes the fundamentals of vernal pool conservation and restoration, and provides a discussion of the benefits of conservation versus restoration for vernal pools and the seven focal species. The conceptual discussion relies on information from the Recovery Plan, as well as data and information provided by renowned local vernal pool experts Scott McMillan and Tom Oberbauer of AECOM. Mr. McMillan and Mr. Oberbauer each have over 20 years of experience with vernal pools in San Diego County and are recognized as leading vernal pool experts by the local resource agencies.

3.1 CONSERVATION OF VERNAL POOL HABITAT

The protection of the focal vernal pool species through vernal pool habitat conservation can be achieved through a number of mechanisms, from conservation easements to the purchase of land. A number of factors are important in determining the value of additional conservation to the focal species (USFWS 1998), as follows:

- Vernal pools are not independent of each other or the vernal pool complex, which includes the watershed. Maintaining the fullest possible range of biological connections within and among the pools and the pool complex is important to long-term viability of pool species and ecosystem functions.

- Conservation of the vernal pools and their associated watersheds is important to the successful conservation of a full array of vernal pools and their constituent species. Preservation efforts cannot be exclusive of the physical attributes that characterize the

complexes and associations (e.g., pool soils and topography), as the habitats that contain vernal pools can be as rare as the listed species associated with them.

- There is substantial variation associated with individual pools. The size of the pools or complexes should not be the only factor when evaluating the value of preservation. Preserve design and size will affect the number and quality of biological interactions and the types and frequency of disturbance.

- Currently, no estimates are available for the effective population sizes necessary to maintain self-supporting populations of the listed vernal pool plant and animal species. As a general ecological rule, the extreme rarity and restricted geographic ranges of the listed vernal pool species in Southern California support the need to preserve the maximum amount of remaining existing populations and habitat. With these criteria, the broadest array of species will be maintained, the risk of losing individual species or pool types will be reduced, and the greatest local genetic and environmental differentiation will be retained.

Based on the factors discussed above, conservation would generally be considered the most beneficial approach to the recovery of the focal species, as long as additional vernal pool habitat is available for acquisition and management. This is especially true where there is opportunity to expand important habitat connectivity; protect vernal pool habitat that increases complex diversity and ecological diversity; or, where possible, to improve the protection of local genetic differentiation of the focal species.

The primary issue with prioritizing additional conservation over habitat restoration and enhancement is the quality of the existing preserved pools and pool complexes, and the quality of vernal pool habitat for potential additional preservation. Despite being preserved, many of the vernal pools and vernal pool complexes continue to suffer declines in habitat quality and in focal species population numbers and health. The same can be said for much of the vernal pool habitat with potential to be added into the preserve system. The value of adding additional vernal pool habitat into preservation will be substantially negated if existing preserved vernal pool habitat continues to decline in quality and potential to support the focal species.

3.2 RESTORATION OF VERNAL POOL HABITAT

Critical to the recovery of the focal vernal pool species is the restoration and enhancement of habitat and pools. With active restoration of the priority complexes for each species, populations of listed vernal pool species can be stabilized and expanded in extent and quality, which is

required for down-listing or delisting (USFWS 1998). As with the conservation factors discussed above, the appropriateness of prioritizing restoration over conservation depends on similar factors:

- Restoration may be necessary to maintain and improve the possible range of biological connections within and among the pools and the pool complexes. Restoration may be necessary for long-term viability of pool species and ecosystem functions.

- Certain preserved complexes and pools may require habitat restoration to improve rare attributes and associations important to maintaining the full array of vernal pools and the species found in them, including the maintenance of local genetics and environmental differentiation.

3.3 CONSERVATION VERSUS RESTORATION OF VERNAL POOL HABITAT

The primary goals for the recovery of the focal species is to first eliminate the primary threats to the pools and the habitat, stabilize the populations and supporting habitat, and then expand and improve the preserved vernal pool habitat with restoration and management. It is necessary to consider when additional preservation (eliminate the primary threat) should be the priority and when restoration (expanding and improving) should be the priority.

In general, most of the focal vernal pool plant populations are already being preserved, with just a few exceptions. These populations are scattered throughout the Project; however, in almost all cases, these populations occur in habitat that is impacted by one or more disturbance factors, in particular, nonnative species invasion. Qualitative assessment of the vernal pool complexes over the last 10 years would indicate that, in many cases, the focal species populations and supporting habitats may not be stable and may be on the decline.

With respect to the focal vernal pool plant species, it may not always be appropriate to invest time and money acquiring additional habitat for preservation when the existing preserve resources are in need of habitat rehabilitation. Certainly, acquisition and preservation of key unpreserved vernal pool habitat should continue to be a priority when there are opportunities to expand important habitat connectivity, protect rare habitat types, increase complex and ecological diversity, or protect local genetic differentiation. Within the City's jurisdiction, most of these opportunities have been realized and most of the pools have been conserved so the priority should be restoration and enhancing existing conserved complexes and pools. Habitat restoration of existing vernal pool resources may provide better protection, stabilization, and expansion of vernal pool species and habitats. Habitat protection should include not only the

vernal pools but also the upland areas that support the watershed as well as other important ecological components, especially the pollinators that are so important to the reproductive success of almost all of the focal plant species. These pollinators often depend on and inhabit the areas immediately adjacent to the vernal pools, so restoration or enhancement of upland habitats that buffer the pools will also benefit the pollinators and their ecological requirements.

The concerns for focal vernal pool animal species (San Diego and Riverside fairy shrimp) may differ from those for the plants. While much of the existing preserved habitat that supports the listed shrimp is also impacted by one or more disturbance factors, the shrimp species are not usually subject to the same level of population instability and decline as a result of these disturbance factors. Unless the disturbances are directly affecting hydrological conditions, the populations of the vernal pool shrimp species tend to remain much more stable than the listed plant populations. While these shrimp populations may not be stabilized completely, they are much more stable than the plants, and, in many cases, could go without restoration or enhancement for much longer before populations decline or are lost. With the relatively stable shrimp, more time may be available to acquire additional vernal pool habitat and pools for preservation without concern for loss of existing preserved populations.

It is important to understand that most of the vernal pool habitat that is not currently preserved has a moderate to high level of disturbance. These areas could provide valuable habitat to listed animal species almost immediately upon preservation. However, for the plant species, these areas will require substantial and active restoration to establish the stabilized populations necessary for recovery. Designated and proposed critical habitat (as defined by USFWS), overlaps with many of the conserved complexes within the City (see Appendix A and Tables 2-2 and 2-3). A number of complexes with critical habitat are currently not conserved at all or only in part (75% or 94% conservation level). These sites should be considered for better conservation and preservation of existing resources.

The priority for recovery of the focal vernal pool species is stabilization of existing habitat and focal species populations through conservation. Where preserved vernal pool habitat exists that is declining in quality and stability for focal species, species recovery will require restoration and enhancement of the habitat and pools that support those species.

Recent restoration and enhancement programs that have been conducted on City vernal pool complexes have shown that not only can stabilization be achieved, but also recovery of lost vernal pool species populations. A recent vernal pool restoration project conducted from 2008 to 2010 was successful in recovering spreading navarretia at Nobel Drive and little mousetail

(previously considered a focal species for the City) at Marron Valley. In addition, current HCP focal species were enhanced and at least temporarily stabilized at Otay Lakes (spreading navarretia, San Diego fairy shrimp, and San Diego button-celery), Proctor Valley (San Diego fairy shrimp), and Goat Mesa (San Diego fairy shrimp, Riverside fairy shrimp and San Diego button-celery) (AECOM 2010).

TWP 3 (the next technical white paper in this series) discusses recommended restoration and enhancement activities that are required to, at a minimum, stabilize the focal species populations and habitats, consistent with the goals of the Recovery Plan. These activities are very similar to those implemented recently on the complexes discussed above. TWP 3 also includes additional recommended restoration and enhancement activities to expand, and potentially reclassify, the focal plant and animal species.

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CHAPTER 4
LITERATURE CITED

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ATTACHMENT A
ASSESSMENT OF CONSERVATION ANALYSIS RESULTS TABLES ORGANIZED BY VERNAL POOL COMPLEX

Table A-1: Proposed Project
Table A-2: Alternative 1 (Baseline)
Table A-3: Alternative 2 (Expanded Conservation)

Table A-1: Proposed Project Conservation of Vernal Pools and Focal Species

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
B 11	Mesa Norte	North	100	44	44.0	0.6	44	0.60	0	0.00	n	n	n	0.0	3.9	0.0	1.5	0.0	0.0	4.8	None identified	None identified
B 5-6	Tierra Alta	North	100	1	1.0	0.0	1	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
B 5-8	Lopez Ridge	North	94	3	2.8	0.4	3	0.40	0	0.00	n	n	y	0.0	0.9	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Crescent Heights	North	100	7	7.0	0.0	7	0.04	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Lopez Ridge	North	100	8	8.0	0.2	3	0.02	5	0.17	n	n	y	0.0	2.6	0.0	0.2	0.0	0.0	0.4	None identified	None identified
C 10-16	Winterwood	North	100	61	61.0	0.8	9	0.10	52	0.71	n	n	y	0.0	8.7	0.0	1.1	0.0	0.0	0.4	ERAR, POAB, SDFS	None identified
C 17-18	Fieldstone	North	100	9	9.0	0.3	9	0.32	0	0.00	n	n	n	0.0	2.6	0.0	0.0	0.0	0.0	0.0	None identified	None identified
C 27	Mira Mesa Market Center	North	100	1	1.0	0.1	1	0.06	0	0.00	n	n	n	0.0	0.3	0.0	0.0	0.0	0.0	0.2	None identified	None identified
D 5-8	Parkdale Carroll Canyon	North	75	4	3.0	0.0	0	0.00	4	0.01	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB	None identified
	Carroll Canyon	North	100	119	119.0	1.2	0	0.00	119	1.19	y	n	y	0.0	13.5	1.0	9.8	0.0	0.0	0.0	ERAR, POAB	None identified
F 16-17	Menlo KM Parcel	Central	75	14	10.5	0.1	11	0.16	3	0.03	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
H 1-15	Del Mar Mesa	North	0	3	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Rhodes	North	0	11	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Del Mar Mesa	North	75	2	1.5	0.0	2	0.01	0	0.00	n	n	y	0.0	0.0	0.0	0.2	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Del Mar Mesa/Rhodes	North	100	250	250.0	1.7	149	1.22	101	0.48	n	n	y	0.0	3.9	0.0	10.4	0.0	0.0	2.8	ERAR, POAB, SDFS	None identified
H 17	Shaw Texas	North	100	28	28.0	0.2	28	0.24	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
H 33	East Ocean Air Drive	North	100	2	2.0	0.0	2	0.03	0	0.00	n	n	n	0.0	0.0	0.0	0.3	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
H 38	Carmel Mountain	North	100	64	64.0	0.6	0	0.00	64	0.61	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.4	None identified	None identified
H 39	Greystone Torrey Highlands	North	100	19	19.0	0.7	0	0.00	19	0.69	n	n	n	0.0	1.6	0.0	0.5	0.0	0.0	0.0	None identified	None identified
I 1	Arjons	North	100	34	34.0	0.7	22	0.42	12	0.31	n	n	n	0.0	7.1	0.0	2.3	0.0	0.0	0.2	None identified	ERAR, POAB
I12	Pueblo Lands North	North	0	4	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Pueblo Lands South	North	94	2	1.9	0.0	2	0.02	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.4	None identified	None identified
I 6 B	Bob Baker (Ford Leasing)	North	100	8	8.0	0.1	4	0.07	4	0.01	n	n	n	0.0	2.3	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB
I 6 C	Bob Baker (Facilities Development)	North	100	15	15.0	0.2	15	0.24	0	0.00	n	n	n	0.0	3.5	0.0	0.3	0.0	0.0	0.0	None identified	ERAR, POAB
J 11 E	Slump Block Pools	South	75	2	1.5	0.5	2	0.63	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	
J 11 W	J 11W	South	75	5	3.8	0.4	5	0.49	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 12	J 12	South	75	5	3.8	0.2	5	0.28	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 E	South Otay J 13E	South	0	3	0.0		0	0.00	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13E	South	75	2	1.5	0.0	2	1.50	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13E	South	100	3	3.0	0.0	3	3.00	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 13 N	NDU 1 & 2	South	0	13	0.0		0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1 acre	South	0	7	0.0	0.0	0	0.00	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1 acre	South	100	17	17.0	0.2	11	0.15	6	0.07	y	n	y	0.0	0.0	1.0	0.2	1.7	0.0	0.2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	NDU 1 & 2	South	0	4	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S	South	0	13	0.0	0.0	0	0.00	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S	South	75	10	7.5	0.0	10	0.06	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S & E/ Bachman	South	100	18	18.0	0.4	18	0.44	0	0.00	y	n	y	0.0	0.0	0.0	0.9	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	Brown Field Basins	South	0	2	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Bachman, 905, Brown Field	South	75	3	2.3	0.0	2	0.02	1	0.01	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	905	South	94	1	0.9	0.0	1	0.01	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (South), Anderprises, 905	South	100	131	131.0	2.1	57	0.60	74	1.45	y	y	y	16.9	0.0	7.1	8.3	8.6	20.1	7.7	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 16-18	Goat Mesa	South	75	2	1.5	0.0	2	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Goat Mesa/Wruck Canyon	South	100	21	21.0	0.4	0	0.00	21	0.35	n	y	y	0.0	0.0	0.0	0.6	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 N	Cal Terraces (North)	South	100	63	63.0	0.4	0	0.00	63	0.45	y	y	y	14.8	0.0	5.1	7.2	12.1	6.9	6.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 S	Cal Terraces (North), Otay Mesa Road Helix, Otay Mesa Road Recon	South	100	172	172.0	2.5	0	0.00	172	2.48	y	y	y	43.4	0.0	55.6	24.5	62.1	55.6	25.9	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	St. Jerome's	South	0	6	0.0		0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (North), Clayton Parcel, St. Jerome's, Otay Mesa Road Recon	South	100	121	121.0	1.1	115	0.98	6	0.08	y	y	y	17.5	0.0	19.2	9.8	15.5	4.2	10.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 20-21	La Media ITS	South	75	33	24.8	1.1	4	1.15	29	0.28	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.8	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 21	La Media Swale South	South	100	7	7.0	0.2	0	0.00	7	0.21	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 27	Empire Center	South	100	10	10.0	0.2	10	0.23	0	0.00	n	n	n	0.0	0.0	0.0	1.4	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 28 E	La Media Swale North	South	75	5	3.8	0.1	5	0.16	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 29-30	Lonestar (Caltrans)	South	100	61	61.0	0.8	61	0.80	0	0.00	y	y	y	0.3	0.0	0.0	4.8	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 31	Dennery West	South	100	114	114.0	1.6	114	1.63	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	6.9	7.7	None identified	None identified
J 32	West Otay A, B, C	South	100	44	44.0	0.3	44	0.34	0	0.00	y	n	n	2.1	0.0	3.0	0.6	0.0	0.7	1.6	None identified	None identified
J 34	Bachman	South	0	10	0.0		0	0.00	0	0.02	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Candlelight	South	0	18	0.0		0	0.00	0	0.29	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Bachman	South	75	2	1.5	0.1	2	0.07	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
	Candlelight	South	100	12	12.0	0.0	9	0.02	3	0.01	n	y	y	0.0	0.0	0.0	0.0	0.0	0.7	0.2	None identified	None identified
J 35	Brown Field	South	0	25	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field Basins	South	0	2	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	94	1	0.9	0.0	0	0.00	1	0.01	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	100	2	2.0	0.0	1	0.01	1	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
J 36	Southview	South	75	17	12.8	0.1	7	0.01	10	0.10	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	1.7	None identified	None identified
J 4	Robinhood Ridge	South	100	83	83.0	0.6	0	0.00	83	0.56	y	y	y	5.0	0.0	4.0	6.9	0.0	4.2	5.1	None identified	None identified
	California Crossing	South	100	11	11.0	0.1	11	0.09	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	3.2	None identified	None identified
K 5	Otay Lakes	Central	100	85	85.0	3.2	0	0.00	85	3.20	y	n	y	0.0	0.0	2.0	6.9	0.0	0.0	0.0	ERAR, NAFO	None identified
KK 1	Lake Murray	South	0	1	0.0		0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
KK 2	Pasatiempo	Central	75	10	7.5	0.0	0	0.00	10	0.04	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
MM 1	Marron Valley	South	100	18	18.0	0.2	0	0.00	18	0.18	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 1-4, N 5-6	Teledyne Ryan	Central	75	43	32.3	0.4	41	0.51	2	0.08	n	n	n	0.0	0.2	0.0	0.0	0.0	0.0	1.7	Poab, Nafo, SDFS	None identified
N 5-6	Montgomery Field	Central	0	13	0.0		0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	75	20	15.0	0.2	6	0.06	14	0.19	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	94	226	212.4	5.1	0	0.01	226	5.46	y	n	y	0.0	39.1	0.0	0.0	0.0	0.0	1.9	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	100	23	23.0	1.0	20	0.84	3	0.14	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
N 7	Serra Mesa Library	Central	100	26	26.0	0.4	0	0.00	26	0.41	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 8	General Dynamics	Central	100	22	22.0	0.4	22	0.40	0	0.00	n	n	n	0.0	6.5	0.0	0.3	0.0	0.0	1.2	None identified	None identified
NC	Li Collins/Kelton	North, South	100	5	5.0	0.1	2	0.04	3	0.02	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
OO	Salk Institute	North	0	1	0.0		0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Salk Institute	North	100	14	14.0	0.1	14	0.09	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
Q2	Mission Trails Regional Park	Central	100	17	17.0	0.3	0	0.00	17	0.25	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	1.2	None identified	None identified
Q 3	Castlerock	North	0	4	0.0	0.0	0	0.02	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Castlerock	North	100	5	5.0	0.0	4	0.01	1	0.01	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
QQ	Tecolote Canyon	Central	94	2	1.9	0.0	2	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Tecolote Canyon	Central	100	7	7.0	0.1	0	0.00	7	0.08	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
R 1	Proctor Valley	South	100	124	124.0	1.4	0	0.00	124	1.40	y	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.6	ERAR, NAFO	None identified

														% of Total Population Conserved in Study Area								
Complex ID		**Geographic Area**	**Verna Pool Conservation Level (%)**	**Total Number of Pools in Complex**	**Number of Pools Conserved (Based on % Conservation)**	**SA of Conserved Pools (Acres)**	**Number of Pools in Preserve on Private Land**	**SA of Pools in Preserve on Private Land (Acres)**	**Number Pools in Preserve on Public Land**	**SA of Pools in Preserve on Public Land**	**Designated Spreading Navarretia Critical Habitat Present**	**Proposed RFS Critical Habitat Present**	**Designated SDFS Critical Habitat Present**	**PONU**	**POAB**	**NAFO**	**ERAR**	**ORCA**	**RFS**	**SDFS**	**Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]**	**Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]**
U 15	Magnatron	Central	0	1	0.0		0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
	Sander/ Maganatron	Central	75	38	28.5	0.6	31	0.71	7	0.12	n	n	y	0.0	0.2	0.0	0.0	0.0	0.0	0.3	None identified	ERAR, POAB, ORCA, SDFS
U 19	Cubic (U19)	Central	0	1	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
	Cubic (U19)	Central	75	23	17.3	0.3	23	0.42	0	0.00	n	n	y	0.0	0.2	0.0	0.2	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
X 5	Nobel Drive	North	100	11	11.0	0.1	0	0.00	11	0.10	y	n	n	0.0	0.0	1.0	0.0	0.0	0.0	1.2	SDFS	None identified
X 7	Nobel Research	North	100	28	28.0	0.1	28	0.10	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
TOTAL CONSERVED UNDER THE PROJECT				**2562**	**2346**	**35.5**	**1006**	**15.03**	**1414**	**21.95**	**-**	**-**	**-**	**100.0**	**97**	**99**	**99**	**100**	**99**	**89**		

[1]Based on Recovery Plan (USFWS 1998)

SA= Surface Area

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table A-2: Alternative 1 (Baseline) Conservation of Vernal Pools and Focal Species

Complex ID	Complex Name	Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	% of Total Population Conserved in Study Area							Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
														PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS		
B 5-6	Tierra Alta	North	0	1	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
B 11	Mesa Norte	North	100	44	44.0	0.6	44	0.01	0	0.00	n	n	n	0.0	3.9	0.0	1.5	0.0	0.0	4.8	None identified	None identified
B 5-8	Crescent Heights	North	0	7	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Lopez Ridge	North	94	3	2.8	0.4	3	0.01	0	0.00	n	n	y	0.0	0.9	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Lopez Ridge	North	100	8	8.0	0.2	3	0.01	5	0.17	n	n	y	0.0	2.6	0.0	0.2	0.0	0.0	0.4	None identified	None identified
C 10-16	Winterwood	North	0	14	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Winterwood	North	94	28	26.3	0.4	0	0.01	28	0.38	n	n	y	0.0	4.2	0.0	0.0	0.0	0.0	0.2	ERAR, POAB, SDFS	None identified
	Winterwood	North	100	19	19.0	0.2	0	0.01	19	0.23	n	n	y	0.0	3.5	0.0	1.1	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
C 17-18	Fieldstone	North	100	9	9.0	0.3	9	0.01	0	0.00	n	n	n	0.0	2.6	0.0	0.0	0.0	0.0	0.0	None identified	None identified
C 27	Mira Mesa Market Center	North	0	1	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
D 5-8	Parkdale Carroll Canyon	Central	75	4	3.0	0.0	0	0.01	4	0.01	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB	None identified
	Carroll Canyon	North	100	119	119.0	1.2	0	0.01	119	1.19	y	n	y	0.0	13.5	1.0	9.8	0.0	0.0	0.0	ERAR, POAB	None identified
F 16-17	Menlo KM Parcel	North	0	13	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Menlo KM Parcel	North	100	1	0.2	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
H 1-15	Del Mar Mesa	North	0	4	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Rhodes	North	0	152	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0		None identified
	Del Mar Mesa	North	75	2	1.5	0.0	2	0.01	0	0.00	n	n	y	0.0	0.0	0.0	0.2	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Del Mar Mesa/Rhodes	North	100	108	108.0	0.8	46	0.01	62	0.37	n	n	y	0.0	1.6	0.0	9.5	0.0	0.0	2.0	ERAR, POAB, SDFS	None identified
H 17	Shaw Texas	North	100	28	28.0	0.2	28	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
H 33	East Ocean Air Drive	North	0	2	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
H 38	Carmel Mountain	North	100	64	64.0	0.6	0	0.01	64	0.61	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.4	None identified	None identified
H 39	Greystone Torrey Highlands	North	100	19	19.0	0.7	0	0.01	19	0.68	n	n	n	0.0	1.6	0.0	0.5	0.0	0.0	0.0	None identified	None identified
I 1	Arjons	North	0	34	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB
I 6 C	Bob Baker (Facilities Development)	North	0	15	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB
I 6 B	Bob Baker (Ford Leasing)	North	0	8	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB
I12	Pueblo Lands North	South	0	4	0.0	0.0	0	0	2	0.02	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Pueblo Lands South	South	94	2	1.9	0.0	2	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.4	None identified	None identified
J 11 E	Slump Block Pools	South	75	2	1.5	0.5	2	0.01	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 11 W	J 11W	South	75	5	3.8	0.4	5	0.01	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 12	J 12	South	75	5	3.8	0.2	5	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID	Complex Name	Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 13 E	South Otay J 13E	South	0	6	0.0	0.0	0	0	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13E	South	75	2	1.5	0.0	2	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	NDU 1 & 2	South	0	13	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1 acre	South	0	7	0.0	0.0	0	0	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1acre	South	100	17	17.0	0.2	11	0.01	6	0.07	y	n	y	0.0	0.0	1.0	0.2	1.7	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	NDU 1 & 2	South	0	4	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13E	South	0	3	0.0	0.0	0	0	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S	South	0	36	0.0	0.0	0	0	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Bachman	South	0	2	0.0	0.0	2	0.01	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	Anderprises	South	0	24	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Brown Field Basins	South	0	2	0.0	0.0	0	0	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Bachman, 905, Brown Field	South	75	3	2.3	0.0	0	0	1	0.01	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	905	South	94	1	0.9	0.0	0	0	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (South), Anderprises, 905	South	100	107	107.0	2.0	33	0.01	74	1.44	y	y	y	16.9	0.0	7.1	8.3	8.6	20.1	7.7	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 16-18	Goat Mesa	South	75	2	1.5	0.0	2	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Goat Mesa/Wruck Canyon	South	100	21	21.0	0.4	0	0.01	21	0.35	n	y	y	0.0	0.0	0.0	0.6	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 N	Cal Terraces (North)	South	100	63	63.0	0.4	0	0.01	63	0.45	y	y	y	14.8	0.0	5.1	7.2	12.1	6.9	6.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 S	Cal Terraces (North)	South	100	172	172.0	2.5	0	0.01	172	2.48	y	y	y	43.4	0.0	55.6	24.5	62.1	55.6	25.9	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	St. Jerome's	South	0	23	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (North), Otay Mesa Road Helix, Otay Mesa Road Recon	South	100	104	104.0	0.9	98	0.01	6	0.08	y	y	y	17.5	0.0	19.2	9.8	15.5	2.8	10.3	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID	Complex Name	Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 20-21	La Media ITS	South	0	33	0.0	0.0	33		0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J21	La Media Swale South	South	0	7	0.0	0.0	7		0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 27	Empire Center	South	100	10	10.0	0.2	10	0.01	0	0.00	n	n	n	0.0	0.0	0.0	1.4	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 28 E	La Media Swale North	South	75	5	3.8	0.1	5	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 29-30	Lonestar	South	100	61	61.0	0.8	61	0.01	0	0.00	y	y	y	0.3	0.0	0.0	4.8	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 31	Dennery West	South	0	1	0.0	0.0	0	0	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Dennery West	South	100	113	113.0	1.6	113	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	6.9	7.7	None identified	None identified
J 32	West Otay A, B, C	South	100	44	44.0	0.3	44	0.01	0	0.00	y	n	n	2.1	0.0	3.0	0.6	0.0	0.7	1.6	None identified	None identified
J 34	Bachman	South	0	10	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Candlelight	South	0	30	0.0	0.0	0	0	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Bachman	South	75	2	1.5	0.1	2	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
J 35	Brown Field	South	0	27	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field Basins	South	0	2	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	94	1	0.9	0.0	0	0.01	1	0.01	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
J 36	Southview	South	0	10	0.0	0.0	0	0	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Southview	South	75	7	5.3	0.0	7	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.6	None identified	None identified
J 4	Robinhood Ridge	South	100	83	83.0	0.6	1	0.01	82	0.56	y	y	y	5.0	0.0	4.0	6.9	0.0	4.2	5.1	None identified	None identified
	California Crossing	South	100	11	11.0	0.1	11	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	3.2	None identified	None identified
K 5	Otay Lakes	South	100	85	85.0	3.2	0	0.01	85	3.20	y	n	y	0.0	0.0	2.0	6.9	0.0	0.0	0.0	ERAR, NAFO	None identified
KK 1	Lake Murray	Central	0	1	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
KK 2	Pasatiempo	Central	0	10	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
MM 1	Marron Valley	South	100	18	18.0	0.2	0	0.01	18	0.18	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 1-4, N 5-6	Teledyne Ryan	Central	0	43	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
N 5-6	Montgomery Field	Central	0	52	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	94	230	216.2	5.2	0	0.01	230	5.53	y	n	y	0.0	39.1	0.0	0.0	0.0	0.0	1.9	Poab, Nafo, SDFS	None identified
N 7	Serra Mesa Library	Central	100	26	26.0	0.4	0	0.01	26	0.41	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 8	General Dynamics	Central	100	22	22.0	0.4	22	0.01	0	0.00	n	n	n	0.0	6.5	0.0	0.3	0.0	0.0	1.2	None identified	None identified
NC	Li Collins/ Kelton	North, South	100	5	5.0	0.1	2	0.01	3	0.22	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
OO	Salk Institute	North	0	15	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	
Q2	Mission Trails Regional Park	Central	100	17	17.0	0.3	0	0.01	17	0.25	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	1.2	None identified	None identified
Q3	Castlerock	North	0	9	0.0	0.0	0	0	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	
QQ	Tecolote Canyon	Central	94	2	1.9	0.0	2	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Tecolote Canyon	Central	100	7	7.0	0.1	0	0.01	7	0.08	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
R 1	Proctor Valley	South	100	124	124.0	1.4	0	0.01	124	1.40	y	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.6	ERAR, NAFO	None identified
U 15	Magnatron	Central	0	1	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
	Sander	Central	0	38	0.0	0.0	0	0	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS

														% of Total Population Conserved in Study Area								
Complex ID	Complex Name	Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
U 19	Cubic (U19)	Central	0	24	0.0	0.0		0.01	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
X 5	Nobel Drive	North	100	11	11.0	0.1	0	0	11	0.10	y	n	n	0.0	0.0	1.0	0.0	0.0	0.0	1.2	SDFS	None identified
X 7	Nobel Research	North	100	28	28.0	0.1	28	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
TOTAL CONSERVED UNDER ALT 1-BASELINE				**2562**	**1847**	**28.4**	**605**	**9.16**	**1269**	**20.29**	-	-	-	**100**	**80**	**99**	**94**	**100**	**97**	**84**		

[1]**Based on Recovery Plan (USFWS 1998)**

SA= Surface Area

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table A-3 Alternative 2 (Expanded) Conservation of Vernal Pools and Focal Species

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
B 11	Mesa Norte	North	100	44	44.0	0.6	44	0.60	0	0.00	n	n	n	0.0	3.9	0.0	1.5	0.0	0.0	4.8	None identified	None identified
B 5-6	Tierra Alta	North	100	1	1.0	0.0	1	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
B 5-8	Lopez Ridge	North	94	3	2.8	0.4	3	0.40	0	0.00	n	n	y	0.0	0.9	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Crescent Heights	North	100	7	7.0	0.0	7	0.04	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Lopez Ridge	North	100	8	8.0	0.2	3	0.02	5	0.17	n	n	y	0.0	2.6	0.0	0.2	0.0	0.0	0.4	None identified	None identified
C 10-16	Winterwood	North	100	61	61.0	0.8	9	0.10	52	0.71	n	n	y	0.0	8.7	0.0	1.1	0.0	0.0	0.4	ERAR, POAB, SDFS	None identified
C 17-18	Fieldstone	North	100	9	9.0	0.3	9	0.32	0	0.00	n	n	n	0.0	2.6	0.0	0.0	0.0	0.0	0.0	None identified	None identified
C 27	Mira Mesa Market Center	North	100	1	1.0	0.1	1	0.06	0	0.00	n	n	n	0.0	0.3	0.0	0.0	0.0	0.0	0.2	None identified	None identified
D 5-8	Parkdale Carroll Canyon	North	75	4	3.0	0.0	0	0.00	4	0.01	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB	None identified
	Carroll Canyon	North	100	119	119.0	1.2	0	0.00	119	1.19	y	n	y	0.0	13.5	1.0	9.8	0.0	0.0	0.0	ERAR, POAB	None identified
F 16-17	Menlo KM Parcel	Central	75	14	10.5	0.1	11	0.16	3	0.03	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
H 1-15	Del Mar Mesa	North	0	1	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Rhodes	North	0	6	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Del Mar Mesa	North	75	2	1.5	0.0	2	0.01	0	0.00	n	n	y	0.0	0.0	0.0	0.2	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
	Del Mar Mesa/Rhodes	North	100	257	257.0	1.7	156	1.25	101	0.48	n	n	y	0.0	3.9	0.0	10.4	0.0	0.0	2.8	ERAR, POAB, SDFS	None identified
H 17	Shaw Texas	North	100	28	28.0	0.2	28	0.24	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
H 33	East Ocean Air Drive	North	100	2	2.0	0.0	2	0.03	0	0.00	n	n	n	0.0	0.0	0.0	0.3	0.0	0.0	0.0	ERAR, POAB, SDFS	None identified
H 38	Carmel Mountain	North	100	64	64.0	0.6	0	0.00	64	0.61	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.4	None identified	None identified
H 39	Greystone Torrey Highlands	North	100	19	19.0	0.7	0	0.00	19	0.69	n	n	n	0.0	1.6	0.0	0.5	0.0	0.0	0.0	None identified	None identified
I 1	Arjons	North	100	34	34.0	0.7	22	0.42	12	0.31	n	n	n	0.0	7.1	0.0	2.3	0.0	0.0	0.2	None identified	ERAR, POAB
I12	Pueblo Lands North	North	75	4	3.0	0.0	2	-0.01	2	0.03	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Pueblo Lands South	North	94	2	1.9	0.0	2	0.02	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.4	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
I 6 B	Bob Baker (Ford Leasing)	North	100	8	8.0	0.1	4	0.07	4	0.01	n	n	n	0.0	2.3	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB
I 6 C	Bob Baker (Facilities Development)	North	100	15	15.0	0.2	15	0.24	0	0.00	n	n	n	0.0	3.5	0.0	0.3	0.0	0.0	0.0	None identified	ERAR, POAB
J 11 E	Slump Block Pools	South	75	2	1.5	0.5	2	0.63	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 11 W	J 11W	South	75	5	3.8	0.4	5	0.49	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 12	J 12	South	75	5	3.8	0.2	5	0.28	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 E	South Otay J 13E	South	75	5	3.8	0.0	5	0.03	0	0.00	n	y	y	0.0	0.0	0.0	0.1	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13E	South	100	3	3.0	0.0	3	0.03	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 13 N	NDU 1 & 2	South	0	13	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1 acre	South	75	7	5.3	0.0	7	0.02	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay 1 acre	South	100	17	17.0	0.2	11	0.15	6	0.07	y	n	y	0.0	0.0	1.0	0.2	1.7	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	NDU 1 & 2	South	0	4	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S	South	0	2	0.0	0.0	0	0.00	0	0.00	y	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S	South	75	21	15.8	0.1	21	0.12	0	0.00	y	n	y	0.0	0.0	0.0	0.1	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South Otay J 13S & E/ Bachman	South	100	18	18.0	0.4	18	0.44	0	0.00	y	n	y	0.0	0.0	0.0	0.9	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	Brown Field Basins	South	0	1	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Bachman, 905, Brown Field	South	75	4	3.0	0.0	3	0.03	1	0.01	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	905	South	94	1	0.9	0.0	1	0.01	0	0.00	n	y	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (South), Anderprises, 905	South	100	131	131.0	2.1	57	0.60	74	1.45	y	y	y	16.9	0.0	7.1	8.3	8.6	20.1	7.7	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 16-18	Goat Mesa	South	75	2	1.5	0.0	2	0.01	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Goat Mesa/Wruck Canyon	South	100	21	21.0	0.4	0	0.00	21	0.35	n	y	y	0.0	0.0	0.0	0.6	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 N	Cal Terraces (North)	South	100	63	63.0	0.4	0	0.00	63	0.45	y	y	y	14.8	0.0	5.1	7.2	12.1	6.9	6.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 S	Cal Terraces (North), Otay Mesa Road Helix, Otay Mesa Road Recon	South	100	172	172.0	2.5	0	0.00	172	2.48	y	y	y	43.4	0.0	55.6	24.5	62.1	55.6	25.9	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	St. Jerome's	South	0	6	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	Cal Terraces (North), Clayton Parcel, St. Jerome's, Otay Mesa Road Recon	South	100	121	121.0	1.1	115	0.98	6	0.08	y	y	y	17.5	0.0	19.2	9.8	15.5	4.2	10.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 20-21	La Media ITS	South	75	33	24.8	1.1	4	1.15	29	0.28	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.9	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 21	La Media Swale South	South	100	7	7.0	0.2	0	0.00	7	0.21	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

														% of Total Population Conserved in Study Area								
Complex ID		Geographic Area	Verna Pool Conservation Level (%)	Total Number of Pools in Complex	Number of Pools Conserved (Based on % Conservation)	SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land	Designated Spreading Navarretia Critical Habitat Present	Proposed RFS Critical Habitat Present	Designated SDFS Critical Habitat Present	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]	Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]
J 27	Empire Center	South	100	10	10.0	0.2	10	0.23	0	0.00	n	n	n	0.0	0.0	0.0	1.4	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 28 E	La Media Swale North	South	75	5	3.8	0.1	5	0.16	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0		None identified
J 29-30	Lonestar (Caltrans)	South	100	61	61.0	0.8	61	0.80	0	0.00	y	y	y	0.3	0.0	0.0	4.8	0.0	0.0	0.0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 31	Dennery West	South	100	114	114.0	1.6	114	1.63	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	6.9	7.7	None identified	None identified
J 32	West Otay A, B, C	South	100	44	44.0	0.3	44	0.34	0	0.00	y	n	n	2.1	0.0	3.0	0.6	0.0	0.7	1.6	None identified	None identified
J 34	Bachman	South	0	10	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Candlelight	South	0	18	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Bachman	South	75	2	1.5	0.1	2	0.08	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
	Candlelight	South	100	12	12.0	0.0	9	0.02	3	0.01	n	y	y	0.0	0.0	0.0	0.0	0.0	0.7	0.0	None identified	None identified
J 35	Brown Field	South	0	25	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	75	2	1.5	0.6	0	0.21	2	0.60	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	94	1	0.9	0.0	0	0.00	1	0.01	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Brown Field	South	100	2	2.0	0.0	1	0.01	1	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
J36	Southview	South	100	17	17.0	0.1	7	0.01	10	0.10	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	2.2	None identified	None identified
J 4	Robinhood Ridge	South	100	83	83.0	0.6	0	0.00	83	0.56	y	y	y	5.0	0.0	4.0	6.9	0.0	4.2	5.1	None identified	None identified
	California Crossing	South	100	11	11.0	0.1	11	0.09	0	0.00	n	y	y	0.0	0.0	0.0	0.0	0.0	0.0	3.2	None identified	None identified
K 5	Otay Lakes	Central	100	85	85.0	3.2	0	0.00	85	3.20	y	n	y	0.0	0.0	2.0	6.9	0.0	0.0	0.0	ERAR, NAFO	None identified
KK 1	Lake Murray	South	0	1	0.0	0.0	1	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
KK 2	Pasatiempo	Central	75	10	7.5	0.0	0	0.00	10	0.04	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
MM 1	Marron Valley	South	100	18	18.0	0.2	0	0.00	18	0.18	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 1-4, N 5-6	Teledyne Ryan	Central	75	43	32.3	0.4	41	0.51	2	0.08	n	n	n	0.0	0.2	0.0	0.0	0.0	0.0	1.7	Poab, Nafo, SDFS	None identified
N 5-6	Montgomery Field	Central	0	13	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	75	20	15.0	0.2	6	0.06	14	0.19	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	94	226	212.4	5.1	0	0.01	226	5.46	y	n	y	0.0	39.1	0.0	0.0	0.0	0.0	1.9	Poab, Nafo, SDFS	None identified
	Montgomery Field	Central	100	23	23.0	1.0	20	0.84	3	0.14	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Poab, Nafo, SDFS	None identified
N 7	Serra Mesa Library	Central	100	26	26.0	0.4	0	0.00	26	0.41	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
N 8	General Dynamics	Central	100	22	22.0	0.4	22	0.40	0	0.00	n	n	n	0.0	6.5	0.0	0.3	0.0	0.0	1.2	None identified	None identified
NC	Li Collins/Kelton	North, South	100	5	5.0	0.1	2	0.04	3	0.02	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
OO	Salk Institute	North	0	1	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Salk Institute	North	100	14	14.0	0.1	14	0.09	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
Q2	Mission Trails Regional Park	Central	100	17	17.0	0.3	0	0.00	17	0.25	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	1.2	None identified	None identified
Q 3	Castlerock	North	0	4	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Castlerock	North	100	5	5.0	0.0	4	0.01	1	0.01	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
QQ	Tecolote Canyon	Central	94	2	1.9	0.0	2	0.01	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	None identified
	Tecolote Canyon	Central	100	7	7.0	0.1	0	0.00	7	0.08	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ERAR, NAFO	None identified
R 1	Proctor Valley	South	100	124	124.0	1.4	0	0.00	124	1.40	y	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.6	None identified	ERAR, POAB, ORCA, SDFS
U 15	Magnatron	Central	0	1	0.0	0.0	0	0.00	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
	Sander/ Magnatron	Central	75	38	28.5	0.6	31	0.71	7	0.12	n	n	y	0.0	0.2	0.0	0.0	0.0	0.0	0.3	None identified	ERAR, POAB, ORCA, SDFS

														% of Total Population Conserved in Study Area								
Complex ID		**Geographic Area**	**Verna Pool Conservation Level (%)**	**Total Number of Pools in Complex**	**Number of Pools Conserved (Based on % Conservation)**	**SA of Conserved Pools (Acres)**	**Number of Pools in Preserve on Private Land**	**SA of Pools in Preserve on Private Land (Acres)**	**Number Pools in Preserve on Public Land**	**SA of Pools in Preserve on Public Land**	**Designated Spreading Navarretia Critical Habitat Present**	**Proposed RFS Critical Habitat Present**	**Designated SDFS Critical Habitat Present**	**PONU**	**POAB**	**NAFO**	**ERAR**	**ORCA**	**RFS**	**SDFS**	**Complex Identified as Necessary to Stabilize the Following Focal Species Populations[1]**	**Complex Identified as Necessary to Reclassify he Following Focal Focal Species Populations[1]**
U 19	Cubic (U19)	Central	0	1	0.0	0.0	0	0.00	0	0.00	n	n	y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
	Cubic (U19)	Central	75	23	17.3	0.3	23	0.42	0	0.00	n	n	y	0.0	0.2	0.0	0.2	0.0	0.0	0.0	None identified	ERAR, POAB, ORCA, SDFS
X 5	Nobel Drive	North	100	11	11.0	0.1	0	0.00	11	0.10	y	n	n	0.0	0.0	1.0	0.0	0.0	0.0	1.2	SDFS	None identified
X 7	Nobel Research	North	100	28	28.0	0.1	28	0.10	0	0.00	n	n	n	0.0	0.0	0.0	0.0	0.0	0.0	0.2	None identified	None identified
TOTAL CONSERVED UNDER ATL 2-EXPANDED				**2562**	**2378**	**35.7**	**1038**	**15.18**	**1418**	**22.78**	**-**	**-**	**-**	**100**	**97**	**99**	**99**	**100**	**99**	**90**		

[1]Based on Recovery Plan (USFWS 1998)

SA= Surface Area

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Technical White Paper 2
Draft assessment of conservation of seven target species

Review

Ellen T. Bauder

Most of what I have to say about this TWP is contained without my responses to the 14 questions. Below are summary comments.

Chapter 1. Introduction

1.1. Project Background

The description of the three alternatives is incomprehensible to me. I don't understand how the word "baseline" is being used. It has been used in various ways, none well defined, in the two TWPs I have reviewed. What is meant by "in the same geography with less area?"

1.2. Overview of HCP Planning Area and TWP2 Area of Conservation Analysis

1.3. Conservation Assessment Overview

There needs to be a glossary somewhere to define words/phrases such as baseline, preserve, Planning Area, conserved, area of conservation analysis, etc. I found the text and tables to be very confusing, partly because of the imprecise use of terms. Also, Table 1-1 is hard to understand because the map in Figure 1-1 is completely inadequate to determine the locations, geographical relationships and types of pools that are in each planning area category.

Number and total surface area of pools "conserved" is wholly inadequate for an assessment or comparison of the alternatives. I have discussed this at greater length in the review of TWP#1, as well as my answers to the questions attached to this TWP.

The Recovery Plan calls for maintenance of "genetic diversity and population stability of the listed species…." How can the material presented in this TWP help anyone understand how the pools included or excluded contribute to this two-pronged goal?

Each of the gap sites needs its own detailed discussion, as outlined in the response to question #11.

Chapter 2. Conservation Assessment

This chapter does not qualify as a conservation assessment since it focuses on numbers of pools, total surface area and total % of population "conserved." First of all, important elements critical to conservation are not discussed, and certainly not discussed in relation

to the sufficiency of any of the alternatives to sustain genetic diversity and population stability as required by the Recovery Plan. The % conservation level doesn't make sense to me. For example, I look at the J13 pools, home to three focal plant species and containing important pools, pool networks and watersheds, and find these pools are part of the gap analysis, *i.e.*, will not be "conserved." Yet Table 2-1 indicates that *Orcuttia californica* populations will be 100% conserved.

Chapter 3. Discussion of Conservation versus Restoration

I concur with the statement that the highest priority should be given to land acquisition (or other instrument of land protection such as an easement), along with protection of lands still subject to high levels of disturbance. It is possible for sites to self-restore if disturbance is curtailed (See answer to question #13). Some can be improved by a combination of minimal habitat manipulation and elimination of disturbance. Until the remaining pools are protected from disturbance and monitored to maintain that protection, there needs to be a compelling set of reasons to undertake intensive restoration projects.

I am not convinced that non-native species are as critical a problem as they may appear to be, with the exception of wetland weeds like *Agrostis avenacea*, *Lolium* spp., *Polypogon monspeliensis*. The major threat to the population stability of the focal species, other than direct destruction of habitat, is alteration of the pool and watershed hydrology. Please see "Function 4. Maintain Characteristic Plant Community," Chapter 4, Bauder *et al*. (2009). Note that introduced species do not play a major role in our model.

In the early years of a restoration program involving inoculation and the building of a seed bank from scratch, weed densities may well have a greater effect than under other circumstances. The sequence of introduction of species into a "blank" habitat has been shown to affect competitive outcomes.

> It is important to understand that most of the vernal pool habitat that is not currently preserved has a moderate to high level of disturbance. These areas could provide valuable habitat to listed animal species almost immediately upon preservation. However, for the plant species, these areas will require substantial and active restoration to establish the stabilized populations necessary for recovery. TWP#2, p. 24

I concur with this statement, but the first step is to preserve the land and protect it from further disturbance. Stabilization of plant populations can follow. Unless the land is preserved, restoration is irrelevant.

Chapter 4. Literature Cited

The literature cited is inadequate. This is discussed in the response to question #1.

Appendix A

Even with my own extensive vernal pool map collection, I found this table difficult to navigate. Abbreviations and complex names are not always clear. NDU 1 and 2? Each complex needs its own narrative.

Technical White Paper 2
Draft assessment of conservation of seven target species

Responses to Questions

Ellen T. Bauder

1. *Are there additional sources of literature/information not in the TWP that should be consulted?*

Please see the TWP#1 review and comments to questions.

General vernal pool planning documents that have not been cited are the MCAB Miramar INRMP (updated 2011); the NAS Miramar vernal pool management plan (Bauder and Wier, 1991) and the draft HGM Guidebook (Bauder *et al*., 2009).

2. *Are the maps useful for understanding impacts and distribution of the seven focal species?*

The maps are not useful. They are at too large (coarse) a scale, and discrimination between the two shades of gray is impossible.

3. *How important are pollinators for vernal pool conservation?*
4. *How important are pollinators for the conservation of the focal species?*

By vernal pool conservation, I assume we are talking about conservation of the biota, not the pools themselves.

The breeding system of most of the characteristic vernal pool flora is unknown, although it is likely the majority are out crossers, either obligate or facultative out crossers. Therefore, pollinators are quite important. Pollination studies focused on *Pogogyne abramsii* have been done by Mills (contained in reports to Caltrans by Zedler in 1986, 1987 and 1991) and Schiller *et al*. (2000). I am unaware of studies that have looked at pollination from the perspective of the pollinators themselves. Where do they reside and how do they feed during both the wet and dry phases of vernal pools? What is necessary for reproduction? What impacts have landscape plants and irrigation had on the presence and abundance of non-native insects? Do these insects compete with native pollinators? Are they equally as efficient as native pollinators? Honeybees visit *Pogogyne abramsii* flowers, but it has been noted by many that they are large and clumsy in their manipulations compared to the native bees and flies. Landscape plants undoubtedly provide year around habitat for honeybees. Irrigation promotes the population growth of exotic ants that can have an impact on the native ants that provide food for the horned lizard (Soule *et al*., 1992; Bolger, 2007).

Links between uplands flora and fauna and vernal pool functions like pollination have been studied more in northern California than in San Diego County. See the review of TWP#1 and question responses for more on this subject.

5. *What is the probability of effectiveness of pollinators given distances between complexes / vernal pools? Some pools have been isolated for years (e.g., Bob Baker on Miramar (Series I) and General Dynamic (N 8)/Teledyne Ryan (N1-4) and still appear fully functional. Is isolation an issue for vernal pools and functions?*

Isolation is relative. For this to have meaning, we would need to know the following: the area of the site and the array of pool habitat contained therein; extent and condition of the on-site habitat (uplands, especially) and flora; the requirements of the putative pollinators of the focal species in this area (Eryngium and *Pogogyne abramsii*); the movement capabilities of the pollinator fauna, coupled with the distance to other vegetation (native or cultivated); the likelihood that irrigated, cultivated vegetation may provide alternative habitat for vernal pool pollinators or exotic pollinators that substitute for native pollinators; and the possibility of a shift to greater inbreeding in primarily outcrossing species. That the sites appear fully functional does not mean that they are. Have they been monitored? I recall the Baker site was monitored for a number of years but doubt it still is. Secondly, decline in seed set and inbreeding depression would likely occur within a long time frame.

6. *What is the impact of pollinator success in restoration for each species?*

See Mills in Zedler (cited above), Schiller *et al*. (2000) and Leong (in press).

There are four questions on pollinators but none on habitat (attributes, quality, etc.) or pool functions/functioning. Please consult the draft HGM guidebook that I, along with my team of experts, spent nearly a decade developing, testing and refining (Bauder *et al*., 2009). In this guidebook we present a rigorous description of the salient features of the ecosystem, list and describe the important functions that occur in vernal pools, identify the variables that contribute most to each function, present statistical analysis of data collected to test direct and indirect measures of function, and provide detailed methods and criteria for assessing function in southern Californian vernal pools.

The metrics presented in this TWP for evaluating alternative conservation plans are minimal and minimally informative. Numbers of pools and total pool surface area are but a starting point for development of an HCP.

7. *It appears that the project conserves 91.6 percent of the known vernal pools. Is the remaining 8.4 percent important for the viability of the seven focal species?*

The information presented in the two TWPs that I have reviewed does not allow me to answer this question. As I indicated in my review of TWP#1, information on habitat, complex condition, configuration and morphology of pools, among other things, is not reported or discussed; areas supposedly "conserved" have not been adequately protected; co-occurrences of important species have not been discussed; and there are errors in Appendix A.

I found it impossible to decipher the various tables presented in this TWP to make an informed judgment on the relative merits, drawbacks and impacts of the three alternatives.

8. *How would you evaluate the effectiveness of the alternatives in conserving and protecting vernal pools? What indices are most useful (percentages of pools, number of populations preserved, etc.) What other measures should be considered.*

I have provided input on this question above and in my review and response to questions for TWP#1.

9. *How can we evaluate the differences in connectivity of the various alternatives? Is one that much better than another?*

I thought an in depth analysis of patch/site connectivity was done for the MSCP.

I cannot begin to address this important and complicated question. It is a study in and of itself (see comment above) and well beyond the scope of a review. At a minimum, columns should be added to a habitat table (suggested in my review of TWP#1) indicating 1) distance to nearest pool habitat, 2) edge to area ratio and 3) nature of barriers between the site and other natural lands, as well as vernal pool habitat. Give every site a connectivity score, based on some well-defined scale that could be supported by isolation/edge effect literature. An example of a disturbance scale can be found in Appendix D2 of Bauder *et al*. (2009).

10. *What are the characteristics of a vernal pool that must be conserved and one that could be lost?*

Please see Bauder *et al*. (2009) for a detailed consideration of this extremely complex topic. Different pool attributes have greater or lesser importance for different functions. For the entire ecosystem to function (water storage, flora, fauna, etc.), numerous functions and variables must be considered simultaneously. We looked at a number of functions and a wide array of variables before we pared them down to those presented in the guidebook. For technical reasons, we were unable to take data on water quality, nor were we able to explore biogeochemical functions. Population genetics was beyond our scope.

One that could be lost? I do not understand what is being asked for in this part of the question.

11. *Since the majority of vernal pools occur on MCAS Miramar and Camp Pendleton, is the City's effort in vain if those federal military pools are not protected.*

The City's efforts are not in vain, but they are incomplete. MCAB Miramar is the only vernal pool landscape left in the County that has not been irreparably fragmented or disturbed, with the possible exception of Del Mar Mesa and possibly some of the pools on Otay Mesa (J 23-25). Furthermore, according to TWP#1, it accounts for nearly two thirds of the remaining vernal pools in the Planning Area. Miramar is critical to the conservation of vernal pools in southern California, but the City plays an important role and should do all that it can to support this region-wide conservation effort.

That most of the vernal pool landscapes occur on military lands is a strong argument for preserving and protecting the pools within the Planning Area that are relatively large and protected (Montgomery Field) or have connectivity with canyons or other pool preserves. This would include the H1-15 pools on Del Mar Mesa, the Winterwood pools in Mira Mesa (C 10-16 + those between Sunny Meadow and New Salem—all connected to a canyon), the I 1 (Arjons) pools adjacent to Carroll Canyon, U pools south of SR 52 (several contiguous groups), the J14 pools at the head of a canyon, and all of the J13 pools (connections to each other, the J11 and J12 pools and to Spring Canyon). These are meant to be examples only, not a comprehensive list. By not mentioning particular complexes, I am not implying they are unworthy of protection.

A table that summarizes the reasons for and against inclusion of sites that are not protected by the alternatives (as indicated in Tables 2.4-6) would be useful. This could be consolidated into one table that addresses the excluded sites common to all three alternatives, then adds on the two alternatives.

The rationale behind the NAS Miramar vernal pool management plan I wrote with Howie Wier (1991) was to reconnect complexes that had been separated by dirt roads, buildings, fences, etc. so that they could function at a watershed or landscape scale.

12. *How important is federally identified Critical Habitat if the vernal pools are protected (how important is it to protect land in critical habitat that does not contain vernal pools).*

This question contains two separate questions. Critical Habitat is an important tool used to protect vernal pools and should not be abandoned if lands are "conserved" or protected by the City but retained as an additional level of protection.

Land that does not contain vernal pools can be considered critical habitat if it has a soil type or geomorphology that might support introduction of imperiled species. An example would be Stockpen soils and *Pogogyne nudiuscula*. Although the plant apparently does not require Stockpen soils to grow, its historic association—likely

exclusive association—with this soil series didn't happen by accident. We simply do not understand the relationship, which may go well beyond the species to its associates, pollinators, etc.. Land without pools may also be important as a buffer or has habitat to organisms that are important to vernal pools or are seasonal or occasional vernal pool visitors. The pool biota did not evolve in an ecological vacuum.

13. *Is large-scale restoration important to recover the focal species? Is so which species and where? How do you determine this?*

The intent of this question is not clear. Does it refer to large scale, as in landscape scale? Or is it referring to the intensity and degree of restoration?

I have mentioned before the need for a discussion of the enhancement/restoration/creation continuum. To start with, it would be important to describe a series of manipulations ranging from the least to the most intrusive. For an example of this kind of scale, see Table 5.5 and Appendix D2, Bauder *et al*., 2009).

The least intrusive actions would be to protect an area and let it self-restore. The I 7 pools on MCAB Miramar are a perfect example of this hands off approach. This complex was severely disturbed by unauthorized vehicle traffic (mostly motorcycles), as documented by aerial photographs taken in the 1970s (Bauder, 1994). A photo taken of the site in 1993 prior to a restoration project, indicates the degree of self-recovery that had taken place in the intervening decades when vehicles no longer visited the site. Surveys taken in 1979, 1986 and 1991 also provide before-project data to compare with the pre-restoration surveys done in 1992/93 (Bauder, 1994).

A restoration project was begun on this site summer of 1993. Methods included mechanical removal of fill, but otherwise were modest in degree and intensity. For a comprehensive summary of the implementation of this project see Bauder (1994) and for the 5-yr monitoring data see Bauder and Sakrison (2001). Other, more modest restoration projects were completed on the MM National Natural Landmark pools (MCAB Miramar) (Bauder, 1987, 1988 and 1992 reports).

Circumstances may require more intensive habitat manipulation. This could involve major re-contouring of the landscape with heavy equipment or creation of new pools where historic pool microtopography has been severely disturbed or obliterated. De novo construction of pools on suitable soils where none existed historically may be called for, but certainly should be an option chosen only when less artificial solutions are available.

Many techniques have been used for inoculation, weed control, revegetation of mounds, control of siltation and so forth.

Because effective, low cost management and enhancement of vernal pools may involve a major effort and long-term commitment by the City of San Diego, management techniques that have been used and manipulative projects that have been completed need

to be thoroughly evaluated. Only with that knowledge can scarce resources be most effectively applied.

14. *All of the alternatives appear to conserve the majority of the species and focal species. Is the conservation of these pools really now down to long-term management? How these pools are managed.*

My career-long position has been to give the protection of land the highest priority (See also p. 22 of the TWP). When I did my survey for CDFG in 1986, I was deeply saddened by the losses and condition of San Diego's vernal pools that I knew took place over the 7 yr- period following state and federal species listings and approval of a City of San Diego vernal pool protection plan. It appeared the end of the ecosystem had pretty much arrived. Here we are, 25 years later, still willing, apparently, to let vernal pools go. At this point, every scrap has something to tell us. Many listed in the gap analysis tables are important, not simply scraps.

When we have preserved all we can, and secured that habitat from further disturbance, management will take the lead position. But this cannot happen until a major effort has been made to save what is left. Given that <5% of the ecosystem remains, and much of that is in terrible shape, it is clear that many large and small compromises have been made in the years since the late 1970's. And pool conservation lost most of them.

Response to Questions: Marie Simovich

Technical White Paper 2
Draft assessment of conservation of seven target species

Overall, I found this TWP very difficult to review. There is so little information here. There are simply a few, unsubstantiated general statements loosely based on a couple of tables with a lot of errors. I'm sorry – I don't know what else to say.

1. *Are there additional sources of literature/information not in the TWP that should be consulted?*
   Yes. See TWP1 questions.

2. *Are the maps useful for understanding impacts and distribution of the seven focal species?*
   No. They are undecipherable.

3. *How important are pollinators for vernal pool conservation?*
   Except for wind pollinated plants, that is the only way to get genetic recombination. Some plants are capable of selfing, but that will result in inbreeding. I would suspect Ellen Bauder would have more to say on this.

4. *How important are pollinators for the conservation of the focal species?*
   See Q3.

5. *What is the probability of effectiveness of pollinators given distances between complexes / vernal pools? Some pools have been isolated for years (e.g., Bob Baker on Miramar (Series I) and General Dynamic (N 8)/Teledyne Ryan (N1-4) and still appear fully functional. Is isolation an issue for vernal pools and functions.*
   I'm not familiar with the pollination literature, but somebody should figure out
   a. How far the pollinators can and do travel.
   b. If there still are viable populations of pollinators in the areas.
   c. If different, more generalized pollinators have stepped in.
   d. If the plants are just germinating from the seed bank and not replenishing it.

   As for isolation, it can be both bad and good. It can reduce genetic variability, potential for rescue (sources and sinks), and pollination. However, too much connectivity can result in homogenization, influx of exotics, loss of genetic integrity and loss of local adaptation (see TWP1 questions for references).
   As for functions, see the HGM (Bauder 2009)

6. *What is the impact of pollinator success in restoration for each species?*
   I am not familiar with this literature but see comments above.

7. *It appears that the project conserves 91.6 percent of the known vernal pools. Is the remaining 8.4 percent important for the viability of the seven focal species?*
   I should think so.
   a. No information on the *quality or level of function* of the pools in the different areas is provided or discussed.

b. What if the pools to be lost are the best in terms of species diversity, focal species population density or genetic variability?
c. What if they are important source populations (positive population growth) and many of the others are sinks (negative population growth – not self sustaining)?

8. *How would you evaluate the effectiveness of the alternatives in conserving and protecting vernal pools? What indices are most useful (percentages of pools, number of populations preserved etc.) What other measures should be considered.*
    a. There is no way to evaluate the effectiveness of the alternatives because no information is provided by which to distinguish them. All that is given is numbers of pools and as noted previously, many of these are incorrect.
    b. Things that need to be considered include aspects of quality
        i. Pool function – hydrology, floral and faunal community diversity
        ii. Population viability
        iii. Population genetics – variability, uniqueness and adaptation
        iv. Probability of persistence of focal species
        v. Species integrity (presence of hybrids)
        vi. Presence of invasive species
        vii. Connectivity
        viii. Sources and sinks
        ix. Disturbance
        x. Buffer – potential to protect
        xi. More…….

9. *How can we evaluate the differences in connectivity of the various alternatives? Is one that much better than another?*
I can't tell from the map.

10. *What are the characteristics of a vernal pool that must be conserved and one that could be lost?*
This is covered in detail in the HGM (Bauder et al. 2009). It includes among other things but boils down to **quality and function.**
    a. Hydrology
    b. Upland integrity
    c. Level of disturbance
    d. Connectivity
    e. Floral and faunal community diversity
    f. Presence of indicator species (not just endangered)
    g. Presence of exotics and weeds
    h. Feasibility of protection
    i. I would also include population viability and genetic characters of focal species populations = probability of persistence.
    j. I would also include the extended food chain – inc. birds and amphibians.

11. *Since the majority of vernal pools occur on MCAS Miramar and Camp Pendleton, is the City's effort in vain if those federal military pools are not protected.*
In my opinion, yes. This should be pretty obvious. These are some of the best and most protected (up to this point) pools. If organisms such as *B. sandiegonensis* are endangered due to 97% loss of their

former habitat (therefore populations), how can ignoring two-thirds or more of what is left be good or helpful? If the City pools are all that remain, you are pretty much left a metapopulation where the sub-polulations have a poor chance of persistence over space or time.

12. *How important is federally identified Critical Habitat if the vernal pools are protected (how important is it to protect land in critical habitat that does not contain vernal pools).*
Very important. Theoretically, that is the habitat that is critical to the survival of the species (except that they ignore important military lands). If an area does not contain (currently or historically) vernal pools or provide watershed, connectivity or habitat for pollinators, amphibians or other organisms critical to the function of pools then it is not critical habitat. (Supposedly it can be if it has the necessary characteristics, but I would never put a pool where no pools had gone before).

13. *Is large scale restoration important to recover the focal species? Is so which species and where? How do you determine this?*
The focus should be diverse communities in a functioning pool systems.
In my opinion, for crustaceans, protection is the best approach.
If restoration is determined to be necessary, recontouring to reestablish natural hydrology is the best approach. The decisions should not be made lightly and should consider at least the following:
    a. Protecting the pools from further disturbance (especially vehicles).
    b. Longevity is associated with species diversity
    c. Decompaction of pools in roads and watershed to allow for native pool and upland plant growth.
    d. Removal of thatch from exotic plants in pools.
    e. I do <u>not</u> advocate creation.
    f. I do not advocate inoculation in most cases, especially without prior genetic assessment.
    g. If anything is done, all possible measures must be taken to avoid transport of weedy species, especially *B. lindahli*.
    h. Assessment of crustacean community and focal species population density and viability before restoration, during monitoring and in establishing success criteria as essential. How can you determine if it is a success if you don't know what was there first and if what you have now is any better, viable or an artifact? See also Bohonak and Simovich 2011 for density assessment.
    i. It is essential to establish pool function before restoration and during monitoring. This should be the basis upon which to choose which pools to save and restore and should be the basis on which success criteria are based.

14. *All of the alternatives appear to conserve the majority of the species and focal species. Is the conservation of these pools really now down to long-term management? How these pools are managed.*
The most important thing is to protect the remaining pools. Then, there is going to have to be some *serious* discussion about how things are managed and how decisions are going to be made. And, most importantly, this should be based on the best scientific data available. Simply putting a fence around pools is not going to be enough. **Furthermore, I see no discussion of quality vs quantity.**

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Comments Received from
M. Simovich

DRAFT

TECHNICAL WHITE PAPER 2: ASSESSMENT OF FOCAL SPECIES CONSERVATION FOR THE CITY OF SAN DIEGO VERNAL POOL HABITAT CONSERVATION PLAN

Prepared for:

San Diego Association of Governments
401 B Street, Suite 800
San Diego, California 92101
Phone: (619) 699-1951

Prepared by:

AECOM
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454

Primary Authors
Lindsey Cavallaro, Scott McMillan,
Tom Oberbauer, and Linnea Spears-Lebrun

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CHAPTER 1
INTRODUCTION

1.1 PROJECT BACKGROUND

The San Diego Association of Governments (SANDAG) will prepare a Vernal Pool Habitat Conservation Plan (HCP) for the City of San Diego (City) largely based on information contained in a series of Technical White Papers (TWPs). The Planning Area for the HCP is the geographical extent of land that will be included in the HCP and for which the protections provided under the HCP are afforded to the seven focal species. For the City's HCP, these lands include the entire jurisdictional boundaries of the City and three areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County. The Planning Area's extent is, by design, the area covered by the City's Multiple Species Conservation Program (MSCP); however, the HCP is a separate but compatible conservation plan for vernal pools and seven endangered focal species not covered under the City's MSCP.

Many lands included in the Planning Area are not under the local land use jurisdiction of the City. These lands could include special districts such as school districts, military lands, other federal properties, and state lands. These lands not under the land use jurisdiction of the City are included in the HCP for the purpose of conservation analysis. However, the regulatory requirements of the HCP will not be applicable. If land ownership is transferred and comes under City jurisdiction, or if the owner voluntarily requests inclusion, the HCP regulatory requirements will be applied after undergoing the appropriate amendment process as outlined within the HCP.

The TWPs focus on seven target vernal pool species consisting of five plants and two crustaceans:

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)

The eight TWP topics are as follows:

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWP 3: Development of Adaptive Management Strategy
- TWP 4: Development of Monitoring Strategy
- TWP 5: Property Analysis Record
- TWP 6: Recommendations for Conditions of Coverage
- TWP 7: Conservation Analysis
- TWP 8: Preserve Management Funding Mechanisms

This is TWP 2. It provides an analysis of the conservation of the seven focal species within the City's proposed Vernal Pool HCP Preserve (Preserve), as well as two alternative Preserve boundaries. The goal of the analysis is to compare the conservation provided to the focal species by each alternative Preserve boundary, as well as identify the gaps in conservation of each alternative. Those complexes not included in each alternative (a conservation gap) are analyzed for occupancy by the focal species and for importance to the recovery of the focal species as identified in the Recovery Plan (USFWS 1998).

The three alternatives are generally described as follows:

- Project: This alternative represents the proposed Project under the City's Vernal Pool HCP Preserve. It includes the Baseline area (Alternative 1, below) plus additional lands outside the Baseline planned for conservation. Approximately 63,169 acres of land in discontiguous parcels from the Mexican border to Lake Hodges would be in this Preserve.

- Alternative 1 – Baseline: This alternative is the baseline for vernal pool conservation. It includes existing conserved lands within the City's adopted Multi-Habitat Planning Area (MHPA). Approximately 62,760 acres are in the same geography with less area would be preserved in the Otay Mesa and Peñasquitos Canyon areas.

- Alternative 2 – Expanded Conservation: This approximately 63,540-acre alternative represents the Project plus conservation of additional vernal pools to protect additional focal species populations. These additional pools would be located generally on vernal pool complexes on Del Mar mesa and Otay Mesa.

Figure 1-1 illustrates the boundaries of each of the three alternatives. It should be noted that the Project and alternatives include primarily lands within City jurisdiction and areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County (Figure 1-1).

1.2 OVERVIEW OF HCP PLANNING AREA AND TWP 2 AREA OF CONSERVATION ANALYSIS

Table 1-1 below categorizes the various locations of vernal pools within the overall Planning Area for the City's vernal pool HCP process and provides the number of known vernal pools within each location. The Planning Area includes lands within the City's jurisdictional boundary plus other lands the City owns, such as Water District properties. There are 7,975 known vernal pools within the overall Planning Area. Those pools in military, state, or other federal ownership, plus other special districts, are not included in the Preserve because the City does not have jurisdiction over these lands. Of the 4,943 vernal pools on lands not included in the Preserve, 4,807 are located on Marine Corps Air Station Miramar. The area of analysis in TWP 2 includes lands under the City's jurisdiction that are both inside and outside of the vernal pool HCP Preserve. As shown in Table 1-1, the area of conservation analysis for TWP 2 (highlighted in grey in the table) includes 2,562 vernal pools. The analysis evaluates conservation for the Project and the two alternatives based on the 2,562 pools and associated focal species. It should be noted that existing conserved lands are located within the vernal pool HCP Preserve that are not subject to City jurisdiction. These lands include 470 vernal pools (and associated focal vernal pool species). However, these 470 pools are not included in this conservation analysis because the City's land use jurisdiction does not apply to these areas;, therefore, the lands cannot be made subject to the requirements of the HCP.

1.3 CONSERVATION ASSESSMENT OVERVIEW

A discussion of the results of the conservation analysis for each of the alternatives relative to the seven focal species is provided in Chapter 2.0. Not only is each preserve boundary alternative different in size, but within the boundary are areas with different percent conservation levels that include 75%, 94%, and 100%. The conservation level denotes the percentage of an area that would be conserved within the Preserve. For example, if a 100-acre parcel is designated with a 94% conservation level, then 94 acres would be conserved within that parcel. The remaining 6 acres would be available for development. For this conservation analysis, conservation of vernal pools and focal species is evaluated based on the percent conservation level or levels assigned to a complex. This means that if a complex (or portion of a complex) has 100 vernal pools designated as 94% conserved, it is assumed that 94 of the 100 vernal pools would be conserved.

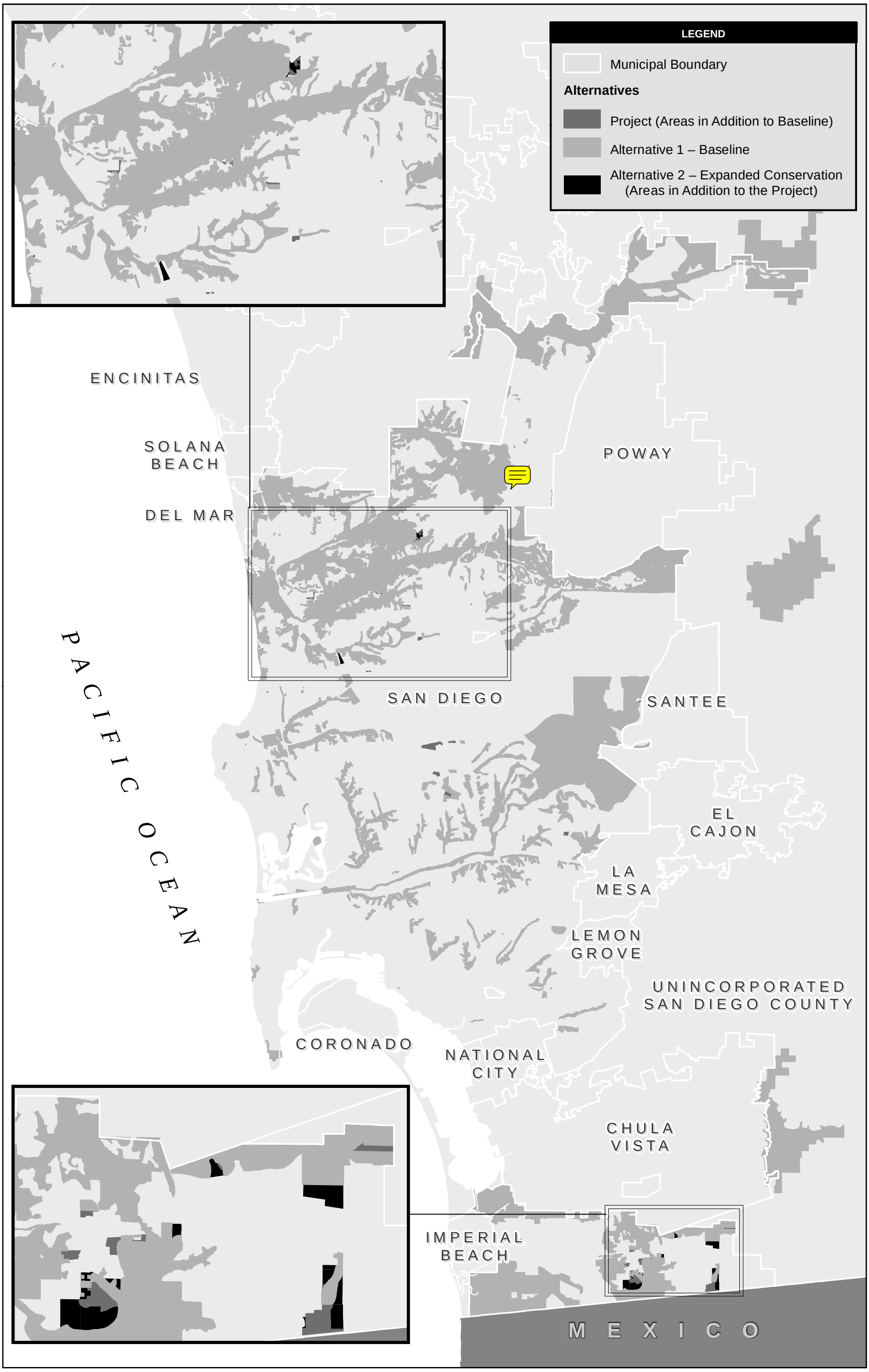
Table 1-1
Number of Vernal Pools within City Vernal Pool HCP Planning Area

Planning Area Category	Definition	Number of Pools		
Overall Planning Area (Total of A through D below)	Lands subject to City jurisdiction and areas not subject to City jurisdiction. Includes Lands Not Included plus Lands Inside and Outside the Vernal Pool HCP Preserve.	7,975		
A) Lands Not Included	Military, state, and federal lands, and special district properties such as school districts that are not within City jurisdiction.	4,943 (4,807 are vernal pools on Marine Corps Air Station Miramar, data is confidential)		
B) Inside of the Vernal Pool HCP Preserve Outside of City's Jurisdiction	Lands not under the City's jurisdiction that will not be subject to the regulations of the City's Vernal Pool HCP.	470		
C) Inside of the Vernal Pool HCP Preserve under City's Jurisdiction*	Lands under the City's jurisdiction that area proposed to be adopted in the Preserve under the City's Vernal Pool HCP.	Project	Alt 1	Alt 2
		2,420	1,874	2,454
D) Outside the Vernal Pool HCP Preserve under City's Jurisdiction*	Outside the Preserve but under the City's jurisdiction.	Project	Alt 1	Alt 2
		142	688	108
Total Pools Evaluated in Conservation Analysis (C+D)		**2,562**	**2,562**	**2,562**

*The rows shaded in grey indicate the pools subject to the conservation analysis in TWP 2; these categories total 2,562 pools.

The following information is provided by vernal pool complex for the 2,562 vernal pools within the area of conservation analysis:

- Conservation level (i.e., percent of conservation of a vernal pool complex). Note that some vernal pool complexes that occur on multiple parcels may have multiple percent conservation levels. For example, one portion of a complex may be 100% conserved, and another portion may be 75% conserved. If a complex is 75% conserved, it is assumed that 75% of the vernal pools and associated focal species populations within that area are conserved.
- Number and total surface area of pools conserved, based on the percent conservation level, as well as number and surface area of pools on private and public lands.
- Presence of U.S. Fish and Wildlife Service's (USFWS) critical habitat within a conserved complex.



Source: SANDAG 2011; SanGIS 2011

3.5 1.75 0 3.5 Miles

Scale: 1:221,760; 1 inch = 3.5 miles

Figure 1-1
Vernal Pool HCP Conservation Boundary Alternatives

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USFWS defines critical habitat as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery. Within the area of conservation analysis, critical habitat is identified for three of the seven focal species: spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp.

Conservation for each focal species consistent with the UUSFWS Recovery Plan for Vernal Pools of Southern California (Recovery Plan) (USFWS 1998) is also evaluated. The Recovery Plan calls for conservation of specific vernal pool complexes to maintain habitat function and species viability to achieve two purposes:

(1) maintain genetic diversity and population stability of the listed species, and/or

(2) reclassify the listed species down from "endangered" to "threatened" status or from "threatened" to delisting the species.

Gaps in conservation (i.e., where important focal species populations and/or key vernal pools are outside the Preserve and, therefore, not conserved) are also discussed for each alternative.

Chapter 3.0 offers a discussion on the potential benefits of acquiring additional lands with focal species populations for conservation versus performing restoration of habitat within existing conserved lands to stabilize and/or enhance focal species populations.

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CHAPTER 2
CONSERVATION ASSESSMENT

2.1 SUMMARY OF ASSESSMENT RESULTS

Attachment A includes tables with the detailed conservation assessment results for each alternative. The tables are organized to display conservation information by vernal pool complex.[1] The following chapter provides a summary and discussion of the analysis results.

Table 2-1 summarizes the vernal pool and focal species conservation provided by each of the three alternatives, including a comparison of the total number and total surface area of vernal pools conserved on both private and public lands, as well as the percentage of focal species populations conserved. Overall, Alternative 2 (Expanded Conservation) would provide the most coverage for both vernal pools (92.8% conserved) and individual focal species. The Project would provide slightly less coverage for vernal pools (91.6% conserved) compared to Alternative 2, with 32 (1.3%) fewer vernal pools conserved. Alternative 1 (Baseline) would provide the least amount of coverage for vernal pools (72.1% conserved), with 499 (19.5%) and 531 (20.7%) fewer conserved pools than the proposed Project and Alternative 2, respectively.

With regard to the seven focal species, all three alternatives would provide the same level of coverage for the Otay Mesa mint (100%), spreading navarretia (99.0%), and California Orcutt grass (100.0%) populations within the area of conservation analysis. As shown in Table 2-1, the proposed Project and Alternative 2 would provide the same level of coverage for the San Diego mesa mint and Riverside fairy shrimp, and nearly the same level of coverage for the San Diego button celery and San Diego fairy shrimp. Alternative 1 would provide a lower level of coverage for these four species compared to both the Project and Alternative 2.

[1] Vernal pool complexes may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Typically the pools in a complex are connected through the landscape, including the supporting watershed and upland habitats. These vernal pool complexes were given identification numbers by Bauder (1986). The numbers were updated by the City of San Diego's Vernal Pool Inventory (2004) and again updated by SANDAG (2011).

Table 2-1
Summary of Vernal Pool and Focal Species Conservation by Alternative
(Area of Conservation Analysis Equals 2,562 Total Pools)

Alternative	Number of Pools within Vernal Pool HCP Preserve under City's Jurisdiction	Number of Pools Conserved Based on Conser-vation Level	Vernal Pools Conserved (%)	Total SA of Conserved Pools (Acres)	Number of Pools in Preserve on Private Land	SA of Pools in Preserve on Private Land (Acres)	Number of Pools in Preserve on Public Land	SA of Pools in Preserve on Public Land (Acres)	Total Popu1ation Conserved in Area of Conservation Analysis (%)*						
									PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS
Project	2,420	2,346	91.6	35.5	1,006	15.0	1,414	22.0	100.0	97.2	99.0	99.1	100.0	99.3	89.3
Alternative 1 – Baseline	1,874	1,847	72.1	28.4	605	9.2	1,269	20.3	100.0	80.1	99.0	94.2	100.0	97.2	83.6
Alternative 2 – Expanded Conservation	2,454	2,378	92.8	35.7	1,038	15.2	1,418	22.8	100.0	97.2	99.0	99.3	100.0	99.3	89.8

Note: Pools, total surface area, and species population conserved is based on 75%, 94%, and/or 100% conservation level by vernal pool complex. See Attachment A for more information.

SA= surface area
PONU = Otay Mesa mint
POAB = San Diego Mesa mint
NAFO = Spreading navarretia
ERAR = San Diego button-celery
ORCA = California Orcutt grass
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-2 provides a summary comparison of the number of conserved complexes with critical habitat in each of the three alternatives. As shown, the Project, Alternative 1, and Alternative 2 would conserved the same number of complexes with critical habitat for all three species (spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp). Information on critical habitat conservation by complex is provided in the tables in Attachment A.

Table 2-2
Number of Complexes with Critical Habitat

Alternative	Complexes with NAFO Critical Habitat	Complexes with Proposed RFS Critical Habitat	Complexes with SDFS Critical Habitat
Project	14	14	23
Alternative 1 – Baseline	14	14	23
Alternative 2 – Expanded Conservation	14	14	23

NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-3 summarizes the total acres of critical habitat that are conserved within each conservation level (75%, 94%, of 100%) for each alternative. As shown, Alternative 2 would conserve the most acres of critical habitat for all three species. Alternative 1 would conserve the fewest acres of critical habitat for all three species.

Table 2-3
Acres of Critical Habitat Conserved by Conservation Level*

Alternative	% Conservation Level	NAFO Critical Habitat (Conserved Acres)*	RFS Critical Habitat (Conserved Acres) *	NAFO Critical Habitat (Conserved Acres) *
Project	75	4.9	161.6	253.7
	94	40.7	0.0	138.7
	100	529.7	562.7	1,083.0
	Total	**575.3**	**724.3**	**1,475.4**
Alternative 1 - Baseline	75	3.1	161.6	188.9
	94	40.7	0.0	142.2
	100	473.1	476.4	955.7
	Total	**516.9**	**638.0**	**1,286.8**
Alternative 2 – Expanded Conservation	75	26.3	168.1	361.1
	94	40.7	0.0	138.7
	100	529.7	616.0	1,113.0
	Total	**596.7**	**784.1**	**1,612.8**

*Conserved acres equals the total acres multiplies by the conservation level %
NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

2.2 CONSERVATION GAP ANALYSIS

This section includes a table for each alternative summarizing the gaps in conservation under the proposed Project and two alternatives for the seven focal species by complex. Complexes identified in the Recovery Plan as necessary to stabilize or reclassify a focal species population that would not be fully conserved under each alternative boundary are also evaluated.

2.2.1 Proposed Project

Under the Project, 15 complexes within the area of conservation analysis would not be fully conserved, as summarized in Table 2-4. A total of 142 pools would be outside of the Preserve (i.e., 0% conservation level), including one pool with spreading navarretia, five pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 43 pools with San Diego fairy shrimp. Six of the 15 complexes not fully conserved under the Project are identified in the Recovery Plan as necessary to stabilize one or more of the focal species.

2.2.2 Alternative 1 – Baseline

Alternative 1 (Baseline) represents the lowest level of conservation of the three alternatives. As shown in Table 2-5, under Alternative 1, 30 complexes within the area of conservation analysis would not be fully conserved. A total of 688 pools would be outside the Preserve, including 53 pools with San Diego mesa mint, one pool with spreading navarretia, 38 pools with San Diego button-celery, four pools with Riverside fairy shrimp, and 79 pools with San Diego fairy shrimp. Compared to the Project, 15 additional complexes would not be fully conserved, with an additional 546 vernal pools that would not be conserved. Of the 30 complexes with unconserved pools, 13 are considered by the Recovery Plan as necessary to stabilize one or more of the focal species. In addition, five of the complexes that are not fully conserved are considered by the Recovery Plan as necessary to reclassify the focal species.

2.2.3 Alternative 2 – Expanded Conservation

Alternative 2 has the highest level of conservation of the three alternatives. Compared to the Project, Alternative 2 would result in 13 complexes within the area of conservation analysis that are not fully conserved as shown in Table 2-6. A total of 108 pools would not be conserved (compared to 142 under the Project), including one pool with spreading navarretia, three pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 40 pools with San Diego fairy shrimp. Compared to the Project, Alternative 2 would conserve two more pools with San Diego button-celery and three more pools with San Diego fairy shrimp. Five of the 13 complexes not fully conserved under Alternative 2 are identified in the Recovery Plan as necessary to stabilize one or more of the focal species.

Table 2-4
Summary of Conservation Gap Analysis for the Project

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
H 1-15	North	Del Mar Mesa	3								ERAR, POAB, SDFS	None identified
		Rhodes	11								ERAR, POAB, SDFS	None identified
I 12	North	Pueblo Lands North	4							3	None identified	None identified
J 13 E	South	South Otay J 13E	3				1				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay 1 acre	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4				1			2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay J 13S	13								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	6								None identified	None identified
J 34	South	Bachman	10							1	None identified	None identified
		Candlelight	18						1	13	None identified	None identified
J 35	South	Brown Field	25				1			3	None identified	None identified
		Brown Field Basins	2								None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
N 5-6	Central	Montgomery Field	13							7	POAB, NAFO, SDFS	None identified

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
OO	North	Salk Institute	1								None identified	None identified
Q 3	North	Castlerock	4							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
U 19	Central	Cubic (U19)	1								None identified	None identified
TOTAL			**142**			**1**	**5**		**1**	**43**		

[1] The total number of pools not within the Preserve represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis. See Attachment A for additional information.
PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

Table 2-5
Summary of Conservation Gap Analysis for Alternative 1 – Baseline

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
B 5-6	North	Tierra Alta	**1**								ERAR, POAB, SDFS	None identified
B 5-8	North	Crescent Heights	**7**								ERAR, POAB, SDFS	None identified
C 10-16	North	Winterwood	14		**2**					**1**	ERAR, POAB, SDFS	None identified
C 27	North	Mira Mesa Market Center	1		**1**					**1**	None identified	None identified
F 16-17	North	Menlo KM Parcel	13							1	None identified	None identified
H 1-15	North	Del Mar Mesa	4								ERAR, POAB, SDFS	None identified
	North	Rhodes	152		**7**		**6**			**4**	ERAR, POAB, SDFS	None identified
H 33	North	East Ocean Air Drive	2				2				ERAR, POAB, SDFS	None identified
I 1	North	Arjons	34		22		15			1	None identified	ERAR, POAB
I 12	North	Pueblo Lands	4							4	None identified	None identified
I 6 C	North	Bob Baker (Facilities Development)	15		7		2				None identified	ERAR, POAB
I 6 B	North	Bob Baker (Ford Leasing)	8		11						None identified	ERAR, POAB
J 13E	South	South Otay J 13E	6				1				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay 1 acre	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
J 13 S	South	Bachman	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	NDU 1 & 2	4							2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13S	36				7				ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13E	3									
J14	South	Anderprises	24								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	Brown Field Basins	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	23						2	1	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 20-21	South	La Media ITS	33							6	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J21	South	La Media Swale South	7								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 31	South	Dennery West	1								None identified	None identified

Complex ID	Geographic Area	Complex Name	Number of Pools Not within the Preserve[1]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
J 34	South	Bachman	13							1	None identified	None identified
	South	Candlelight	27						2	13	None identified	None identified
J 35	South	Brown Field	27				1			3	None identified	None identified
	South	Brown Field Basins	2								None identified	None identified
J 36	South	Southview	10							7	None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
KK 2	Central	Pasatiempo	10								None identified	None identified
N 1-4, N 5-6	Central	Teledyne Ryan	43		1					11	POAB, NAFO, SDFS	None identified
N 5-6	Central	Montgomery Field	52							7	POAB, NAFO, SDFS	None identified
OO	North	Salk Institute	15								None identified	None identified
Q3	North	Castlerock	9							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
	Central	Sander	38		1					2	None identified	ERAR, POAB, ORCA, SDFS
U 19	Central	Cubic (U19)	24		1		2				None identified	ERAR, POAB, ORCA, SDFS
TOTAL			**688**	**0**	**53**	**1**	**38**	**0**	**4**	**79**		

[1] The total number of pools not conserved represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

Table 2-6
Summary of Conservation Gap Analysis for Alternative 2 – Expanded Conservation

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[2]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
H 1-15	North	Del Mar Mesa	1								ERAR, POAB, SDFS	None identified
		Rhodes	6								ERAR, POAB, SDFS	None identified
J 13 N	South	NDU 1 & 2	13			1	2			13	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay 1 acre	1								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4							2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
		South Otay J 13S	2								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	1								ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2 W	South	St. Jerome's	6								None identified	None identified
J 34	South	Bachman	10							1	None identified	None identified
		Candlelight	18						1	13	None identified	None identified
J 35	South	Brown Field	25				1			3	None identified	None identified
KK 1	Central	Lake Murray	1								None identified	None identified
N 5-6	Central	Montgomery Field	13								POAB, NAFO, SDFS	None identified

Complex ID	Geographic Area	Name	Number of Pools Not within the Preserve[2]	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Complex Identified as Necessary to Stabilize Focal Species Population[2]	Complex Identified as Necessary to Reclassify Focal Species Population[2]
OO	North	Salk Institute	1							7	None identified	None identified
Q 3	North	Castlerock	4							1	None identified	None identified
U 15	Central	Magnatron	1								None identified	None identified
U 19	Central	Cubic (U19)	1								None identified	None identified
TOTAL			**108**			**1**	**3**		**1**	**40**		

[1] The total number of pools not conserved represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

[2] Based on Recovery Plan (USFWS 1998)

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CHAPTER 3
DISCUSSION OF CONSERVATION VERSUS RESTORATION

The recovery strategy for the listed vernal pool species in the USFWS Recovery Plan focuses primarily on reducing and/or eliminating the primary existing threats to vernal pool habitat, specifically habitat destruction and modification, alteration of hydrology and watershed area, and competition from nonnative species. The required efforts to recover the focal vernal pool species identified in the City's HCP involves both conservation and restoration. USFWS defines conservation as the stabilization of the populations through habitat procurement and management, while restoration is the stabilization, enhancement, and expansion of existing vernal pool habitat through active habitat restoration and management (USFWS 1998).

This section describes the fundamentals of vernal pool conservation and restoration, and provides a discussion of the benefits of conservation versus restoration for vernal pools and the seven focal species. The conceptual discussion relies on information from the Recovery Plan, as well as data and information provided by renowned local vernal pool experts Scott McMillan and Tom Oberbauer of AECOM. Mr. McMillan and Mr. Oberbauer each have over 20 years of experience with vernal pools in San Diego County and are recognized as leading vernal pool experts by the local resource agencies.

3.1 CONSERVATION OF VERNAL POOL HABITAT

The protection of the focal vernal pool species through vernal pool habitat conservation can be achieved through a number of mechanisms, from conservation easements to the purchase of land. A number of factors are important in determining the value of additional conservation to the focal species (USFWS 1998), as follows:

- Vernal pools are not independent of each other or the vernal pool complex, which includes the watershed. Maintaining the fullest possible range of biological connections within and among the pools and the pool complex is important to long-term viability of pool species and ecosystem functions.

- Conservation of the vernal pools and their associated watersheds is important to the successful conservation of a full array of vernal pools and their constituent species. Preservation efforts cannot be exclusive of the physical attributes that characterize the

complexes and associations (e.g., pool soils and topography), as the habitats that contain vernal pools can be as rare as the listed species associated with them.

- There is substantial variation associated with individual pools. The size of the pools or complexes should not be the only factor when evaluating the value of preservation. Preserve design and size will affect the number and quality of biological interactions and the types and frequency of disturbance.

- Currently, no estimates are available for the effective population sizes necessary to maintain self-supporting populations of the listed vernal pool plant and animal species. As a general ecological rule, the extreme rarity and restricted geographic ranges of the listed vernal pool species in Southern California support the need to preserve the maximum amount of remaining existing populations and habitat. With these criteria, the broadest array of species will be maintained, the risk of losing individual species or pool types will be reduced, and the greatest local genetic and environmental differentiation will be retained.

Based on the factors discussed above, conservation would generally be considered the most beneficial approach to the recovery of the focal species, as long as additional vernal pool habitat is available for acquisition and management. This is especially true where there is opportunity to expand important habitat connectivity; protect vernal pool habitat that increases complex diversity and ecological diversity; or, where possible, to improve the protection of local genetic differentiation of the focal species.

The primary issue with prioritizing additional conservation over habitat restoration and enhancement is the quality of the existing preserved pools and pool complexes, and the quality of vernal pool habitat for potential additional preservation. Despite being preserved, many of the vernal pools and vernal pool complexes continue to suffer declines in habitat quality and in focal species population numbers and health. The same can be said for much of the vernal pool habitat with potential to be added into the preserve system. The value of adding additional vernal pool habitat into preservation will be substantially negated if existing preserved vernal pool habitat continues to decline in quality and potential to support the focal species.

3.2 RESTORATION OF VERNAL POOL HABITAT

Critical to the recovery of the focal vernal pool species is the restoration and enhancement of habitat and pools. With active restoration of the priority complexes for each species, populations of listed vernal pool species can be stabilized and expanded in extent and quality, which is

required for down-listing or delisting (USFWS 1998). As with the conservation factors discussed above, the appropriateness of prioritizing restoration over conservation depends on similar factors:

- Restoration may be necessary to maintain and improve the possible range of biological connections within and among the pools and the pool complexes. Restoration may be necessary for long-term viability of pool species and ecosystem functions.

- Certain preserved complexes and pools may require habitat restoration to improve rare attributes and associations important to maintaining the full array of vernal pools and the species found in them, including the maintenance of local genetics and environmental differentiation.

3.3 CONSERVATION VERSUS RESTORATION OF VERNAL POOL HABITAT

The primary goals for the recovery of the focal species is to first eliminate the primary threats to the pools and the habitat, stabilize the populations and supporting habitat, and then expand and improve the preserved vernal pool habitat with restoration and management. It is necessary to consider when additional preservation (eliminate the primary threat) should be the priority and when restoration (expanding and improving) should be the priority.

In general, most of the focal vernal pool plant populations are already being preserved, with just a few exceptions. These populations are scattered throughout the Project; however, in almost all cases, these populations occur in habitat that is impacted by one or more disturbance factors, in particular, nonnative species invasion. Qualitative assessment of the vernal pool complexes over the last 10 years would indicate that, in many cases, the focal species populations and supporting habitats may not be stable and may be on the decline.

With respect to the focal vernal pool plant species, it may not always be appropriate to invest time and money acquiring additional habitat for preservation when the existing preserve resources are in need of habitat rehabilitation. Certainly, acquisition and preservation of key unpreserved vernal pool habitat should continue to be a priority when there are opportunities to expand important habitat connectivity, protect rare habitat types, increase complex and ecological diversity, or protect local genetic differentiation. Within the City's jurisdiction, most of these opportunities have been realized and most of the pools have been conserved so the priority should be restoration and enhancing existing conserved complexes and pools. Habitat restoration of existing vernal pool resources may provide better protection, stabilization, and expansion of vernal pool species and habitats. Habitat protection should include not only the

vernal pools but also the upland areas that support the watershed as well as other important ecological components, especially the pollinators that are so important to the reproductive success of almost all of the focal plant species. These pollinators often depend on and inhabit the areas immediately adjacent to the vernal pools, so restoration or enhancement of upland habitats that buffer the pools will also benefit the pollinators and their ecological requirements.

The concerns for focal vernal pool animal species (San Diego and Riverside fairy shrimp) may differ from those for the plants. While much of the existing preserved habitat that supports the listed shrimp is also impacted by one or more disturbance factors, the shrimp species are not usually subject to the same level of population instability and decline as a result of these disturbance factors. Unless the disturbances are directly affecting hydrological conditions, the populations of the vernal pool shrimp species tend to remain much more stable than the listed plant populations. While these shrimp populations may not be stabilized completely, they are much more stable than the plants, and, in many cases, could go without restoration or enhancement for much longer before populations decline or are lost. With the relatively stable shrimp, more time may be available to acquire additional vernal pool habitat and pools for preservation without concern for loss of existing preserved populations.

It is important to understand that most of the vernal pool habitat that is not currently preserved has a moderate to high level of disturbance. These areas could provide valuable habitat to listed animal species almost immediately upon preservation. However, for the plant species, these areas will require substantial and active restoration to establish the stabilized populations necessary for recovery. Designated and proposed critical habitat (as defined by USFWS), overlaps with many of the conserved complexes within the City (see Appendix A and Tables 2-2 and 2-3). A number of complexes with critical habitat are currently not conserved at all or only in part (75% or 94% conservation level). These sites should be considered for better conservation and preservation of existing resources.

The priority for recovery of the focal vernal pool species is stabilization of existing habitat and focal species populations through conservation. Where preserved vernal pool habitat exists that is declining in quality and stability for focal species, species recovery will require restoration and enhancement of the habitat and pools that support those species.

Recent restoration and enhancement programs that have been conducted on City vernal pool complexes have shown that not only can stabilization be achieved, but also recovery of lost vernal pool species populations. A recent vernal pool restoration project conducted from 2008 to 2010 was successful in recovering spreading navarretia at Nobel Drive and little mousetail

(previously considered a focal species for the City) at Marron Valley. In addition, current HCP focal species were enhanced and at least temporarily stabilized at Otay Lakes (spreading navarretia, San Diego fairy shrimp, and San Diego button-celery), Proctor Valley (San Diego fairy shrimp), and Goat Mesa (San Diego fairy shrimp, Riverside fairy shrimp and San Diego button-celery) (AECOM 2010).

TWP 3 (the next technical white paper in this series) discusses recommended restoration and enhancement activities that are required to, at a minimum, stabilize the focal species populations and habitats, consistent with the goals of the Recovery Plan. These activities are very similar to those implemented recently on the complexes discussed above. TWP 3 also includes additional recommended restoration and enhancement activities to expand, and potentially reclassify, the focal plant and animal species.

FINAL DRAFT

TECHNICAL WHITE PAPER 2: ASSESSMENT OF FOCAL SPECIES CONSERVATION FOR THE CITY OF SAN DIEGO VERNAL POOL HABITAT CONSERVATION PLAN

Prepared for:

San Diego Association of Governments Service Bureau
401 B Street, Suite 800
San Diego, California 92101
Phone: (619) 699-1951

Prepared by:

AECOM
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454

Primary Authors
Lindsey Cavallaro, Scott McMillan,
Tom Oberbauer, and Linnea Spears-Lebrun

Please note that the Technical White Papers are the products of professional consultants hired by SANDAG Service Bureau, and that the City of San Diego and/or Wildlife Agencies may not concur with the recommendations contained in these reports.

August 2012

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INTRODUCTION

1.1 PROJECT BACKGROUND

The San Diego Association of Governments Service Bureau (SANDAG SB) will prepare a Vernal Pool Habitat Conservation Plan (VPHCP) for the City of San Diego (City) largely based on information contained in a series of Technical White Papers (TWPs). The Planning Area for the VPHCP is the geographical extent of land that will be included in the VPHCP and for which the protections provided under the VPHCP are afforded to the seven focal species. For the City's VPHCP, these lands include the entire jurisdictional boundaries of the City and three areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County. The Planning Area's extent is, by design, the area covered by the City's Multiple Species Conservation Program (MSCP); however, the VPHCP is a separate but compatible conservation plan for vernal pools and seven endangered focal species not covered under the City's MSCP.

Many lands included in the Planning Area are not under the local land use jurisdiction of the City. These lands could include special districts such as school districts, military lands, other federal properties, and state lands. These lands not under the land use jurisdiction of the City are included in the VPHCP for the purpose of conservation analysis. However, the regulatory requirements of the VPHCP will not be applicable. If land ownership is transferred and comes under City jurisdiction, or if the owner voluntarily requests inclusion, the VPHCP regulatory requirements will be applied after undergoing the appropriate amendment process as outlined within the VPHCP.

The TWPs focus on seven target vernal pool species, consisting of five plants and two crustaceans:

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)

The eight TWP topics are as follows:

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWP 3: TWPs 3 & 4: Adaptive Management and Monitoring Strategy for the City of San Diego Vernal Pool Habitat Conservation Plan (a combined document)
- TWP 5: Cost Evaluation for Implementation of Management and Monitoring
- TWP 6: Recommendations for Conditions of Coverage
- TWP 7: Conservation Analysis
- TWP 8: Preserve Management Funding Mechanisms

This is TWP 2. It presents data related to the conservation of the seven focal species within the City's proposed VPHCP Preserve (Preserve), as well as two alternative Preserve boundaries. The goal of the analysis is to compare the conservation provided for the focal species by each alternative VPHCP Preserve boundary, as well as identify the gaps in conservation of each alternative. Vernal pools not conserved under an alternative (a conservation gap) are analyzed for occupancy by the focal species and for importance to the recovery of the focal species as identified in the US Fish and Wildlife Service Recovery Plan (USFWS 1998).

The three VPHCP Preserve alternatives are generally described as follows:

- Project: This alternative represents the proposed Project under the City's VPHCP Preserve. It includes the Baseline area (Alternative 1, below) plus additional lands outside the Baseline planned for conservation. Approximately 63,151 acres of land in discontiguous parcels from the Mexican border to Lake Hodges would be in this Preserve.

- Alternative 1 – Baseline: This alternative is the baseline for vernal pool conservation. It includes existing conserved lands within the City's adopted Multi-Habitat Planning Area (MHPA). Approximately 62,725 acres are in the same geography with less area would be preserved in the Otay Mesa and Peñasquitos Canyon areas.

- Alternative 2 – Expanded Conservation: This approximately 63,537-acre alternative represents the Project plus conservation of additional vernal pools to protect additional focal species populations. These additional pools would be located generally on vernal pool complexes on Del Mar mesa and Otay Mesa.

Figure 1-1 illustrates the boundaries of each of the three alternatives. It should be noted that the Project and alternatives include primarily lands within City jurisdiction and areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County (Figure 1-1).

1.2 OVERVIEW OF VPHCP PLANNING AREA

There are 10,668 known vernal pools within the overall VPHCP Planning Area. This includes 7,531 vernal pools on Marine Corps Air Station (MCAS) Miramar[1]. This VPHCP process addresses lands subject to the City's jurisdiction that are both inside and outside of the VPHCP Preserve, as well as lands outside the City's jurisdiction that are both inside and outside of the VPHCP Preserve. The VPHCP does not address the 7,531 pools on MCAS Miramar, as the vernal pool data is confidential. The rationale for coverage for the VPHCP Preserve is evaluated based on the conservation of focal species within lands subject to City jurisdiction only.

As shown in Table 1-1, the lands subject to City jurisdiction (highlighted in grey in the table) include 2,329 vernal pools that are subject to the City's jurisdiction. The analysis evaluates conservation for the Project and the two alternatives based on those 2,329 pools and associated seven focal species. It should be noted that existing conserved lands are also located within the VPHCP Preserve that are not subject to City jurisdiction (Item D in Table 1-1). These lands are not addressed in TWP 2 because the City's land use jurisdiction does not apply to these areas; therefore, the lands cannot be made subject to the requirements of the VPHCP.

Table 1-1. Number of Vernal Pools within City's VPHCP Planning Area

City Jurisdiction and Preserve Status	Number Of Pools		
VPHCP Planning Area (Total of A through E)	**10,668**		
A. MCAS Miramar (not analyzed in TWPs)	7,531		
	Project	**Alt 1**	**Alt 2**
VPHCP Preserve (B + D)	2,861	2,201	2,898
B. Inside Preserve, Not Subject to City's Jurisdiction	678	557	680
C. Outside Preserve, Not Subject to City's Jurisdiction	130	251	128
D. Inside Preserve, Subject to City's Jurisdiction*	2,183	1,644	2,218
E. Outside Preserve, Subject to City's Jurisdiction*	146	685	111
Pools Subject to City Jurisdiction in Conservation Analysis (D + E)	**2,329**	**2,329**	**2,329**

* The rows shaded in grey indicate the pools subject to City jurisdiction. These categories total 2,329 pools, which are included in the conservation analysis in TWP 2.

[1] Refer to the MCAS Miramar Integrated Natural Resources Management Plan (INRMP) 2011-2015 (Gene Stout and Associates et al.) at http://www.marines.mil/unit/mcasmiramar/ems/Pages/NaturalResources.aspx. Basins include vernal pools as well as other features, such as marsh, puddles, impoundments, ditches, ruts, excavation, building foundation, and watercourse, all of which are considered vernal pool habitat and could contain focal species. Refer to p. 4-10 and 4-11 and Table 4.3.3. of the INRMP.

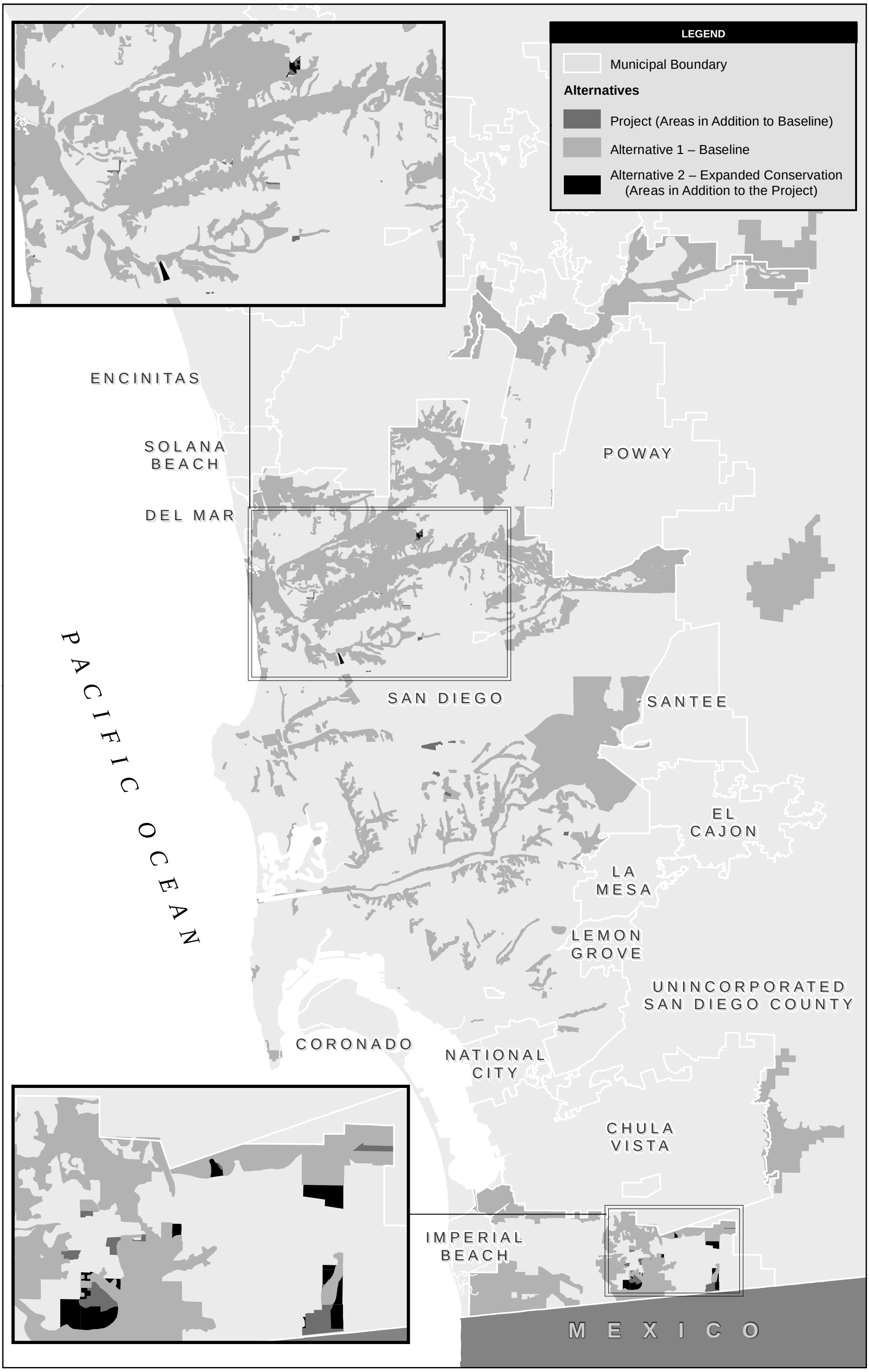
1.3 CONSERVATION ASSESSMENT OVERVIEW

A discussion of the results of the conservation analysis for each of the VPHCP Preserve alternatives relative to the seven focal species is provided in Chapter 2.0. Not only is each preserve boundary alternative different in size, but within the boundary are areas with different conservation levels that include 0%, 75%, 94%, and 100%. The conservation level denotes the percentage of an area that would be conserved within that particular parcel. For example, if a 100-acre parcel is designated with a 94% conservation level, then 94 acres would be conserved within that parcel. The remaining 6 acres would be available for development. For the analysis in TWP 2, conservation of vernal pools and focal species is evaluated based on the percent conservation level (or levels) assigned to a parcel. This means that if a vernal pool complex2 (or portion of a complex) has 100 vernal pools designated as 94% conserved, it is assumed that 94 of the 100 vernal pools (and associated vernal pool focal species) would be conserved. Vernal pools within a 0% conservation level area are assumed to be lost to development.

The following information is provided by vernal pool complex for the 2,329 vernal pools subject to City jurisdiction that are analyzed in the conservation analysis for TWP 2:

- Conservation level (i.e., percent of conservation of a vernal pool complex). Note that some vernal pool complexes that occur on multiple parcels may have multiple conservation levels. For example, one portion of a complex may be 100% conserved, and another portion may be 75% conserved. If a complex is 75% conserved, it is assumed that 75% of the vernal pools and associated focal species populations within that area are conserved.
- Total number of vernal pools, including number of pools under City control and under other control (State, Federal, or private ownership)
- Total surface area of pools conserved, based on the percent conservation level, as well as surface area of pools under City control and under other control
- Presence of USFWS-designated critical habitat for the three applicable species with designated critical habitat (spreading navarretia, San Diego fairy shrimp, and Riverside fairy shrimp)

[2] Vernal pool complexes may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Typically the pools in a complex are connected through the landscape, including the supporting watershed and upland habitats. These vernal pool complexes were given identification numbers by Bauder (1986). The numbers were updated by the City of San Diego's Vernal Pool Inventory (2004) and again updated by SANDAG (2011).



Source: SANDAG 2011; SanGIS 2011

3.5 1.75 0 3.5 Miles

Scale: 1:221,760; 1 inch = 3.5 miles

Figure 1-1
Vernal Pool HCP Conservation Boundary Alternatives

Path: P:\2011\60218732\06GIS\6.3_Layout\Figures\Alternatives_vert_BW.mxd, 10/26/2011, augellop

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- Number of conserved pools occupied with the seven focal species
- Consistency with the USFWS Recovery Plan for Vernal Pools of Southern California (Recovery Plan) (USFWS 1998) for conservation of complexes identified as necessary to "stabilize" (Appendix F of the Recovery Plan) and "reclassify" (Appendix G of the Recovery Plan) the focal species populations

USFWS defines critical habitat as a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery. Within the area of the conservation analysis, critical habitat is identified for three of the seven focal species: spreading navarretia, Riverside fairy shrimp (proposed), and San Diego fairy shrimp. Final critical habitat boundaries are published in the Federal Register.

Conservation for each focal species consistent with the USFWS Recovery Plan is evaluated. The USFWS Recovery Plan calls for conservation of specific vernal pool complexes as necessary to maintain habitat function and species viability to achieve two purposes:

(1) maintain genetic diversity and population stability of the listed species, and/or (Appendix F of the Recovery Plan)

(2) reclassify the listed species down from "endangered" to "threatened" status or from "threatened" to delisting the species (Appendix G of the Recovery Plan)

Gaps in conservation (i.e., where important focal species populations and/or key vernal pools are outside the Preserve and, therefore, not conserved at any level) are also discussed for each alternative.

Chapter 3.0 offers a discussion on the potential benefits of acquiring additional lands with focal species populations for conservation versus performing restoration of habitat within existing conserved lands to stabilize and/or enhance focal species populations.

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CHAPTER 2
CONSERVATION ASSESSMENT

2.1 SUMMARY OF ASSESSMENT RESULTS

Attachment A includes tables with the detailed conservation assessment results for each VPHCP Preserve alternative. The tables are organized to display conservation information by vernal pool complex. The following chapter provides a summary and discussion of the analysis results.

Table 2-1 summarizes the vernal pool and focal species conservation provided by each of the three alternatives, including a comparison of the total number complexes and vernal pools conserved on both City-controlled lands and other lands (State, Federal, or private) as well as the percentage of focal species populations conserved within lands under City jurisdiction. Overall, Alternative 2 (Expanded Conservation) would provide the most coverage for both vernal pools under City jurisdiction (91.6% conserved) and individual focal species. The Project would provide only slightly less coverage for vernal pools (90.6% conserved) compared to Alternative 2, with 24 (1%) fewer vernal pools conserved. Alternative 1 (Baseline) would provide the least amount of coverage for vernal pools (69.6% conserved), with 488 (21.0%) and 512 (22.0%) fewer conserved pools than the proposed Project and Alternative 2, respectively.

With regard to the seven focal species, all three alternatives would provide the same percentage of conservation for Otay Mesa mint (100%), spreading navarretia (98.9%), and California Orcutt grass (100.0%) populations within the Preserve on lands subject to City jurisdiction (Table 2-1). The proposed Project and Alternative 2 would provide the same percentage of conservation for San Diego mesa mint (96.9%) and Riverside fairy shrimp (99.1%), and nearly the same percentage of conservation for San Diego button-celery (99.0% vs. 99.3%) and San Diego fairy shrimp (87.9% vs. 88.3%). Alternative 1 would provide a lower percentage of conservation for these four species compared to both the Project and Alternative 2.

As summarized in Table 2-1, both the Project and Alternative 2 provide conservation of the complexes identified in the USFWS Recovery Plan as important to stabilize and reclassify each of the focal species populations. Therefore, they are considered consistent with the USFWS Recovery Plan. Alternative 1 (Baseline) is not consistent because it does not conserve all of the complexes identified in the USFWS Recovery Plan. More detail regarding consistency with the USFWS Recovery Plan is provided in Tables A-1 through A-3 in Attachment A.

Table 2-1
Summary of Vernal Pool and Focal Species Conservation Inside and Outside the VPHCP Preserve Subject to City's Jurisdiction

Alternative	Number of Pools in Planning Area Subject to City's Jurisdiction	Number of Complexes within VPHCP Preserve Subject to City's Jurisdiction	Number of Pools within VPHCP Preserve Subject to City's Jurisdiction	Number of Pools Conserved within Preserve Based on Conservation Level*	Number of Pools Lost to Development (Outside and Inside Preserve) Based on Conservation Level*	Consistent with USFWS Recovery Plan for Stabilizing Focal Species[1]	Consistent with USFWS Recovery Plan to Reclassify Focal Species[2]	% Vernal Pools Conserved Based on Conservation Level*	Total Population Conserved in Planning Area Subject to City's Jurisdiction (%)*						
									PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS
Project	2,329	53	2,183	2,109	220 (146 Outside/ 74 Inside)	Yes	Yes	90.6	100	96.9	98.9	99.0	100	99.1	87.9
Alternative 1 – Baseline	2,329	37	1,644	1,621	708 (685 Outside/ 23 Inside)	No	No	69.6	100	79.0	98.9	93.7	100	96.0	79.2
Alternative 2 – Expanded Conservation	2,329	53	2,218	2,133	196 (111 Outside/ 85 Inside)	Yes	Yes	91.6	100	96.9	98.9	99.3	100	99.1	88.3

*Pools and species population conserved is an estimate based on 75%, 94%, and/or 100% conservation level by vernal pool complex. See Attachment A for more detail.

[1] Conserves the complexes identified in Appendix F of the USFWS Recovery Plan (1998) as "necessary to stabilize" the focal species.

[2] Conserves the complexes identified in Appendix G of the USFWS Recovery Plan (1998) as "necessary to reclassify" the focal species.

PONU = Otay Mesa mint
POAB = San Diego mesa mint
NAFO = Spreading navarretia
ERAR = San Diego button-celery
ORCA = California Orcutt grass
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-2 provides a summary comparison of the number complexes conserved (at some level) with critical habitat in each of the three alternatives. As shown, the Project, Alternative 1, and Alternative 2 would conserved the same number of complexes with critical habitat for all three species (spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp). Information on critical habitat conservation by complex is provided in the tables in Attachment A.

Table 2-2
Number of Complexes with Critical Habitat

Alternative	Complexes with NAFO Critical Habitat	Complexes with Proposed RFS Critical Habitat	Complexes with SDFS Critical Habitat
Project	10	11	19
Alternative 1 – Baseline	10	11	19
Alternative 2 – Expanded Conservation	10	11	19

NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-3 summarizes the total acres of critical habitat that are conserved within each conservation level (75%, 94%, of 100%) for each alternative. Table 2-4 shows the total acres of critical habitat for each applicable species conserved within each alternative (based on conservation level), as well as the percentage of critical habitat acres conserved within the overall VPHCP planning area. Alternative 2 provides the most conservation of critical habitat for the three applicable focal species (spreading navarretia, Riverside fairy shrimp, and San Diego fairy shrimp). The Project conserves slightly less critical habitat for spreading navarretia and Riverside fairy shrimp compared to Alternative 2, and approximately 138 fewer acres of San Diego fairy shrimp critical habitat (7.5% less). Alternative 1 provides the least conservation of critical habitat.

2.2 CONSERVATION GAP ANALYSIS

This section includes a table for each alternative summarizing the gaps in conservation under the proposed Project and two alternatives for the seven focal species by complex. Gaps in conservation include vernal pools and complexes (or portions of a complex) that would be outside the VPHCP Preserve (i.e., 0% conserved). Complexes identified in the USFWS Recovery Plan as necessary to stabilize or reclassify a focal species population that would not be conserved under each alternative boundary are also noted.

Table 2-3
Acres of Critical Habitat Conserved by Conservation Level

Alternative	% Conservation Level	NAFO Critical Habitat (Acres)	Proposed RFS Critical Habitat (Acres)	SDFS Critical Habitat (Acres)
Project	75	6.5	215.5	338.2
	94	43.3	0.0	147.6
	100	529.7	615.8	1,083.0
	Subtotal	**579.5**	**831.3**	**1,568.8**
	Total Conserved[1]	**575**	**777**	**1,475**
Alternative 1 – Baseline	75	4.1	215.3	251.9
	94	43.3	0.0	151.3
	100	473.1	562.7	955.7
	Subtotal	**520.5**	**778.0**	**1,358.9**
	Total Conserved[1]	**517**	**724**	**1,287**
Alternative 2 – Expanded Conservation	75	35.02	224.1	481.5
	94	43.33		147.6
	100	529.71	616.0	1,113.0
	Subtotal	**608.06**	**840.1**	**1,742.1**
	Total Conserved[1]	**597**	**784**	**1,613**

[1] Based conservation level (75%, 94%, or 100%)
NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

Table 2-4
Summary of Critical Habitat Conservation by Alternative

	NAFO Critical Habitat Acres	Proposed RFS Critical Habitat Acres	SDFS Critical Habitat Acres
Total Critical Habitat Acres in Planning Area	624	847	1,834
Critical Habitat Conserved by Alternative[1]	**Total Acres Conserved and % of Acres Conserved in Planning Area**		
Project	575 (92.3%)	777 (91.8%)	1,475 (80.4%)
Alternative 1 – Baseline	517 (82.9%)	724 (85.5%)	1,287 (70.1%)
Alternative 2 – Expanded Conservation	597 (95.7%)	784 (92.6%)	1,613 (87.9%)

[1] Based conservation level (75%, 94%, or 100%)
NAFO = Spreading navarretia
RFS = Riverside fairy shrimp
SDFS = San Diego fairy shrimp

2.2.1 Proposed Project

Under the Project, 14 complexes within the area of conservation analysis would not be fully conserved, as summarized in Table 2-5. A total of 146 pools would be outside of the Preserve (i.e., 0% conservation level), including one pool with spreading navarretia, five pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 49 pools with San Diego fairy shrimp. Seven of the 14 complexes not fully conserved under the Project are identified in the USFWS Recovery Plan as necessary to stabilize one or more focal species. Three complexes that are not fully conserved are considered by the USFWS Recovery Plan as necessary to reclassify one or more focal species.

2.2.2 Alternative 1 – Baseline

Alternative 1 (Baseline) represents the lowest level of conservation of the three alternatives. As shown in Table 2-6, under Alternative 1, 28 complexes within the area of conservation analysis would not be fully conserved. A total of 685 pools would be outside the Preserve (0% conserved), including 51 pools with San Diego mesa mint, one pool with spreading navarretia, 38 pools with San Diego button-celery, five pools with Riverside fairy shrimp, and 100 pools with San Diego fairy shrimp. Compared to the Project, 15 additional complexes would not be fully conserved, with an additional 539 vernal pools that would not be conserved. Of the 28 complexes with unconserved pools, 14 are considered by the USFWS Recovery Plan as necessary to stabilize one or more focal species. In addition, six of the complexes that are not fully conserved are considered by the USFWS Recovery Plan as necessary to reclassify one or more focal species.

2.2.3 Alternative 2 – Expanded Conservation

Alternative 2 provides the highest level of conservation of the three alternatives. Alternative 2 would result in 12 complexes that are not fully conserved as shown in Table 2-7 (compared to 14 complexes that are not fully conserved under the Project). Therefore, Alternative 2 provides full conservation of 2 additional complexes compared to the project. A total of 111 pools would be outside the Preserve (compared to 146 under the Project), including one pool with spreading navarretia, three pools with San Diego button-celery, one pool with Riverside fairy shrimp, and 46 pools with San Diego fairy shrimp. Compared to the Project, Alternative 2 would conserve two more pools with San Diego button-celery and three more pools with San Diego fairy shrimp. Seven of the 12 complexes not fully conserved under the Project are identified in the USFWS Recovery Plan as necessary to stabilize one or more focal species, and three complexes that are

not fully conserved are considered by the USFWS Recovery Plan as necessary to reclassify one or more focal species, which is the same as under the Project.

Table 2-5
Summary of Conservation Gap Analysis for the Project[1]

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
H 1-10, 13-15, 18-26	North	Rhodes	14	0	0	0	0	0	0	0	0.09	ERAR, POAB, SDFS	ERAR, POAB
I 12	North	Pueblo Lands	5	0	0	0	0	0	0	4	0.05	None identified	None identified
J 13 E	North	South Otay J 13E	3	0	0	0	1	0	0	0	0.02	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 N	South	NDU 1 & 2	13	0	0	1	2	0	0	13	0.07	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay 1 acre (Private)	7	0	0	0	0	0	0	0	0.02	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4	0	0	0	0	0	0	2	0.21	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13S	13	0	0	0	1	0	0	0	0.09	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	4	0	0	0	0	0	0	0	0.83	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2	South	St. Jerome's	6	0	0	0	0	0	0	0	0.23	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 34	South	Bachman	10	0	0	0	0	0	0	1	0.06	None identified	None identified
	South	Candlelight	18	0	0	0	0	0	1	15	0.38	None identified	None identified

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
J 35	South	Brown Field	25	0	0	0	1	0	0	3	3.01	None identified	None identified
KK 1	Central	Lake Murray	1	0	0	0	0	0	0	0	0.02	None identified	None identified
N 5-6	Central	Montgomery Field	13	0	0	0	0	0	0	7	1.67	POAB, NAFO, SDFS	None identified
Q 3	North	Castlerock	4	0	0	0	0	0	0	4	0.02	None identified	None identified
U 15	Central	SANDERS	1	0	0	0	0	0	0	0	0.34	None identified	ERAR, POAB, ORCA, SDFS
U 19	Central	Cubic	5	0	0	0	0	0	0	0	0.03	None identified	ERAR, POAB, ORCA, SDFS
TOTAL			**146**	**0**	**0**	**1**	**5**	**0**	**1**	**49**	**7.14**		

[1]The total number of pools outside the Preserve represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis. See Attachment A for additional information.

[2] Indicates lost pools occur within a complex identified in the Recovery Plan (USFWS 1998). However, other portions of the complex may be conserved at some level. Refer to Attachment A for details on consistency with the Recovery Plan.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table 2-6
Summary of Conservation Gap Analysis for Alternative 1 – Baseline

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
B 5	North	Tierra Alta	1	0	0	0	0	0	0	0	0.01	ERAR, POAB, SDFS	None identified
B 7-8	North	Crescent Heights	7	0	0	0	0	0	0	1	0.04	ERAR, POAB, SDFS	None identified
C 27	North	Mira Mesa Market Center	1	0	1	0	0	0	0	1	0.06	None identified	None identified
F 16-17	North	Menlo KM Parcel	14	0	0	0	0	0	0	1	0.19	ERAR, POAB, SDFS	None identified
H 1-10, 13-15, 18-26	North	Rhodes	156	0	7	0	6	0	0	4	0.77	ERAR, POAB, SDFS	ERAR, POAB
H 33	North	East Ocean Air Dr	2	0	0	0	2	0	0	0	0.03	ERAR, POAB, SDFS	None identified
I 1	North	Arjons	34	0	22	0	15	0	0	1	0.73	None identified	ERAR, POAB
I 12	North	Pueblo Lands	5	0	0	0	0	0	0	4	0.05	None identified	None identified
I 6 B	North	Ford Leasing (Bob Baker)	8	0	7	0	0	0	0	3	0.08	None identified	ERAR, POAB
I 6 C	North	Facilities Development (Eastgate Miramar Assoc.)	15	0	11	0	2	0	0	6	0.24	None identified	ERAR, POAB
J 13 E	South	South Otay J 13E	6	0	0	0	1	0	0	0	0.05	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
J 13 N	South	NDU 1 & 2	13	0	0	1	2	0	0	13	0.07	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay 1 acre (Private)	7	0	0	0	0	0	0	0	0.02	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	Bachman	2	0	0	0	0	0	0	0	0.01	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	NDU 1 & 2	4	0	0	0	0	0	0	2	0.21	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13S	39	0	0	0	7	0	0	0	0.58	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 14	South	Brown Field Basins	4	0	0	0	0	0	0	0	0.83	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	Handler	24	0	0	0	0	0	0	0	0.07	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2	South	St. Jerome's	24	0	0	0	0	0	3	1	0.41	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 20-21	South	La Media ITS	33	0	0	0	0	0	0	6	1.43	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
J 21	South	La Media Swale South	7	0	0	0	0	0	0	0	0.21	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 34	South	Bachman	13	0	0	0	0	0	0	1	0.07	None identified	None identified
	South	Candlelight	27	0	0	0	0	0	2	15	0.41	None identified	None identified
J 35	South	Brown Field	27	0	0	0	1	0	0	3	3.02	None identified	None identified
J 36	South	Southview	10	0	0	0	0	0	0	7	0.07	None identified	None identified
KK 1	Central	Lake Murray	1	0	0	0	0	0	0	0	0.02	None identified	None identified
KK 2	Central	Pasatiempo	10	0	0	0	0	0	0	0	0.04	None identified	None identified
N 1-4	Central	Teledyne Ryan	43	0	1	0	0	0	0	11	0.59	POAB, NAFO, SDFS	None identified
N 5-6	Central	Montgomery Field	56	0	0	0	0	0	0	7	2.89	POAB, NAFO, SDFS	None identified
OO	North	Salk Institute	15	0	0	0	0	0	0	0	0.09	None identified	None identified
Q 3	North	Castlerock	9	0	0	0	0	0	0	4	0.05	None identified	None identified
U 15	Central	SANDERS	39	0	1	0	0	0	0	2	0.83	None identified	ERAR, POAB, ORCA, SDFS
U 19	Central	Cubic	29	0	1	0	2	0	0	7	0.45	None identified	ERAR, POAB, ORCA, SDFS
TOTAL			**685**	**0**	**51**	**1**	**38**	**0**	**5**	**100**	**14.61**		

[1]The total number of pools outside the Preserve represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis. See Attachment A for additional information..

[2] Indicates lost pools occur within a complex identified in the Recovery Plan (USFWS 1998). However, other portions of the complex may be conserved at some level. Refer to Attachment A for details on consistency with the Recovery Plan.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table 2-7
Summary of Conservation Gap Analysis for Alternative 2 – Expanded Conservation

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
H 1-10, 13-15, 18-26	North	Rhodes	7	0	0	0	0	0	0	0	0.05	ERAR, POAB, SDFS	ERAR, POAB
I 12	North	Pueblo Lands	1	0	0	0	0	0	0	1	0.03	None identified	None identified
J 13 N	South	NDU 1 & 2	13	0	0	1	2	0	0	13	0.07	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay 1 acre (Private)	1	0	0	0	0	0	0	0	0.00	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 13 S	South	NDU 1 & 2	4	0	0	0	0	0	0	2	0.21	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
	South	South Otay J 13S	2	0	0	0	0	0	0	0	0.01	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 2	South	St. Jerome's	6	0	0	0	0	0	0	0	0.23	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
J 34	South	Bachman	10	0	0	0	0	0	0	1	0.06	None identified	None identified
	South	Candlelight	18	0	0	0	0	0	1	15	0.38	None identified	None identified
J 35	South	Brown Field	25	0	0	0	1	0	0	3	3.01	None identified	None identified
KK 1	Central	Lake Murray	1	0	0	0	0	0	0	0	0.02	None identified	None identified
N 5-6	Central	Montgomery Field	13	0	0	0	0	0	0	7	1.67	POAB, NAFO, SDFS	None identified

Complex ID	Geographic Area	Site Name	Number of Pools Lost Outside the Preserve (0% Conserved)	Pools Occupied with Focal Species Lost Outside the Preserve (0% Conserved)							Surface Area of Pools Lost (Acres)	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
				PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS			
Q 3	North	Castlerock	4	0	0	0	0	0	0	4	0.02	None identified	None identified
U 15	Central	SANDERS	1	0	0	0	0	0	0	0	0.34	None identified	ERAR, POAB, ORCA, SDFS
U 19	Central	Cubic	5	0	0	0	0	0	0	0	0.03	None identified	ERAR, POAB, ORCA, SDFS
TOTAL			**111**	**0**	**0**	**1**	**3**	**0**	**1**	**46**	**6.14**		

[1] The total number of pools outside the Preserve represents the total pools that are 0% conserved. Pools and focal species within complexes that have 75% or 94% conservation level are partially conserved and therefore are not included in the gap analysis. See Attachment A for additional information.

[2] Indicates lost pools occur within a complex identified in the Recovery Plan (USFWS 1998). However, other portions of the complex may be conserved at some level. Refer to Attachment A for details on consistency with the Recovery Plan.

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

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CHAPTER 3
DISCUSSION OF CONSERVATION VERSUS ENHANCEMENT/RESTORATION

The recovery strategy for the listed vernal pool species in the USFWS Recovery Plan focuses primarily on reducing and/or eliminating the primary existing threats to vernal pool habitat, specifically habitat destruction and modification, alteration of hydrology and watershed area, and competition from nonnative species. The required efforts to recover the focal vernal pool species identified in the City's VPHCP involves both conservation of existing or historic vernal pool habitat as well as enhancement/restoration of vernal pool habitat. USFWS defines conservation as the stabilization of the populations through habitat procurement and management, while enhancement is the improvement and stabilization of existing vernal pool habitat through active habitat management (e.g., weed control, minor topographic repair), and restoration is the expansion of existing vernal pool habitat through active habitat management (e.g., topographic reconstruction of basin area) (USFWS 1998).

This section describes the fundamentals of vernal pool conservation and enhancement/ restoration, and provides a discussion of the benefits of conservation versus enhancement/ restoration for vernal pools and the seven focal species. The conceptual discussion relies on information from the Recovery Plan, as well as data and information provided by renowned local vernal pool experts Scott McMillan and Tom Oberbauer of AECOM. Mr. McMillan and Mr. Oberbauer each have over 20 years of experience with vernal pools in San Diego County and are recognized as leading vernal pool experts by the local resource agencies.

3.1 CONSERVATION OF VERNAL POOL HABITAT

The protection of the focal vernal pool species through vernal pool habitat conservation can be achieved through a number of mechanisms, from conservation easements to the purchase of land. A number of factors are important in determining the value of additional conservation to the focal species (USFWS 1998), as follows:

- Vernal pools are not independent of each other or the vernal pool complex, which includes the watershed. Maintaining the fullest possible range of biological connections within and among the pools and the pool complex is important to long-term viability of pool species and ecosystem functions.

- Conservation of the vernal pools and their associated watersheds is important to the successful conservation of a full array of vernal pools and their constituent species. Preservation efforts cannot be exclusive of the physical attributes that characterize the complexes and associations (e.g., pool soils and topography), as the habitats that contain vernal pools can be as rare as the listed species associated with them.

- There is substantial variation associated with individual pools. The size of the pools or complexes should not be the only factor when evaluating the value of preservation. Preserve design and size will affect the number and quality of biological interactions and the types and frequency of disturbance.

- Currently, no estimates are available for the effective population sizes necessary to maintain self-supporting populations of the listed vernal pool plant and animal species. As a general ecological rule, the extreme rarity and restricted geographic ranges of the listed vernal pool species in Southern California support the need to preserve the maximum amount of remaining existing populations and habitat. With these criteria, the broadest array of species will be maintained, the risk of losing individual species or pool types will be reduced, and the greatest local genetic and environmental differentiation will be retained.

Based on the factors discussed above, conservation would generally be considered the most beneficial approach to the recovery of the focal species, as long as additional vernal pool habitat is available for acquisition and management. This is especially true where there is opportunity to expand important habitat connectivity; protect vernal pool habitat that increases complex diversity and ecological diversity; or, where possible, to improve the protection of local genetic differentiation of the focal species.

The primary issue with prioritizing additional conservation over habitat restoration and enhancement is the quality of the existing preserved pools and pool complexes, and the quality of vernal pool habitat for potential additional preservation. Despite being preserved, many of the vernal pools and vernal pool complexes continue to suffer declines in habitat quality and in focal species population numbers and health. The same can be said for much of the vernal pool habitat with potential to be added into the preserve system. The value of adding additional vernal pool habitat into preservation will be substantially negated if existing preserved vernal pool habitat continues to decline in quality and potential to support the focal species.

3.2 ENHANCEMENT/RESTORATION OF VERNAL POOL HABITAT

Critical to the recovery of the focal vernal pool species is the enhancement and restoration of habitat and pools. With active enhancement/restoration of the priority complexes for each species, populations of listed vernal pool species can be stabilized and expanded in extent and quality, which is required for down-listing or delisting (USFWS 1998). As with the conservation factors discussed above, the appropriateness of prioritizing enhancement/restoration over conservation depends on similar factors:

- Enhancement/restoration may be necessary to maintain and improve the possible range of biological connections within and among the pools and the pool complexes. Enhancement/restoration may be necessary for long-term viability of pool species and ecosystem functions.

- Certain preserved complexes and pools may require habitat enhancement/restoration to improve rare attributes and associations important to maintaining the full array of vernal pools and the species found in them, including the maintenance of local genetics and environmental differentiation.

3.3 CONSERVATION VERSUS ENHANCEMENT/RESTORATION OF VERNAL POOL HABITAT

The primary goals for the recovery of the focal species is to first eliminate the primary threats to the pools and the habitat, stabilize the populations and supporting habitat, and then expand and improve the preserved vernal pool habitat with enhancement/restoration and management. It is necessary to consider when additional preservation (eliminate the primary threat) should be the priority and when enhancement (improving and stabilizing habitat) and restoration (expanding habitat) should be the priority.

In general, most of the focal vernal pool plant populations are already being preserved, with just a few exceptions. These populations are scattered throughout the Project; however, in almost all cases, these populations occur in habitat that is impacted by one or more disturbance factors, in particular, nonnative species invasion. Qualitative assessment of the vernal pool complexes over the last 10 years would indicate that, in many cases, the focal species populations and supporting habitats may not be stable and may be on the decline.

With respect to the focal vernal pool plant species, it may not always be appropriate to invest time and money acquiring additional habitat for preservation when the existing preserve resources are in need of habitat rehabilitation. Certainly, acquisition and preservation of key unpreserved vernal pool habitat should continue to be a priority when there are opportunities to expand important habitat connectivity, protect rare habitat types, increase complex and ecological diversity, or protect local genetic differentiation. Within the City's jurisdiction, most of these opportunities have been realized and most of the pools have been conserved so the priority should be restoration and enhancing existing conserved complexes and pools. Habitat enhancement/restoration of existing vernal pool resources may provide better protection, stabilization, and expansion of vernal pool species and habitats. Habitat protection should include not only the vernal pools but also the upland areas that support the watershed as well as other important ecological components, especially the pollinators that are so important to the reproductive success of almost all of the focal plant species. Pollinators often depend on and inhabit the areas immediately adjacent to the vernal pools, so restoration or enhancement of upland habitats that buffer the pools will also benefit the pollinators and their ecological requirements.

The concerns for focal vernal pool animal species (San Diego and Riverside fairy shrimp) may differ from those for the plants. While much of the existing preserved habitat that supports the listed shrimp is also impacted by one or more disturbance factors, the occurrence data for shrimp species in preserved habitats suggests that shrimp occurrence has remained stable or increased in the last ten year, while the data for the focal plant species often indicates a decline in occurrence (City of San Diego 2004). This may be due, in part, to the ability of the shrimp species to tolerate more disturbed habitat conditions compared to vernal pool plants. This potential tolerance for disturbance is indicated by the numerous low quality pools and road ruts that support fairy shrimp, but do not support the focal plant species or other endemic vernal pool plant species. However, since the dormant shrimp cyst banks can continue to be expressed for many years without restorative reproduction, the persistent presence of shrimp may not be a direct indicator that the populations are completely stable (Philippi et al. 2001; Simovich and Hathaway 1997).

With the relatively stable shrimp occurrences, more time may be available to acquire additional vernal pool habitat and pools for preservation without concern for loss of existing preserved populations.

It is important to understand that most of the vernal pool habitat that is not currently preserved has a moderate to high level of disturbance. These areas could provide valuable habitat to listed animal species almost immediately upon preservation. However, for the plant species, these

areas will require substantial and active enhancement/restoration to establish the stabilized populations necessary for recovery. Designated and proposed critical habitat (as defined by USFWS), overlaps with many of the conserved complexes within the City (see Appendix A and Tables 2-2 and 2-3). A number of complexes with critical habitat are currently not conserved at all or only in part (75% or 94% conservation level). These sites should be considered for better conservation and preservation of existing resources.

The priority for recovery of the focal vernal pool species is stabilization of existing habitat and focal species populations through conservation. Where preserved vernal pool habitat exists that is declining in quality and stability for focal species, species recovery will require restoration and enhancement of the habitat and pools that support those species.

Recent restoration and enhancement programs that have been conducted on City vernal pool complexes have shown that not only can stabilization be achieved, but also recovery of lost vernal pool species populations. A recent vernal pool enhancement/restoration project conducted from 2008 to 2010 was successful in recovering spreading navarretia at Nobel Drive and little mousetail (previously considered a focal species for the City) at Marron Valley. In addition, current VPHCP focal species were enhanced and at least temporarily stabilized at Otay Lakes (spreading navarretia, San Diego fairy shrimp, and San Diego button-celery), Proctor Valley (San Diego fairy shrimp), and Goat Mesa (San Diego fairy shrimp, Riverside fairy shrimp and San Diego button-celery) (AECOM 2010).

TWP 3 (the next technical white paper in this series) discusses recommended restoration and enhancement activities that are required to, at a minimum, stabilize the focal species populations and habitats, consistent with the goals of the Recovery Plan. These activities are very similar to those implemented recently on the complexes discussed above. TWP 3 also includes additional recommended restoration and enhancement activities to expand, and potentially reclassify, the focal plant and animal species.

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CHAPTER 4
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ATTACHMENT A
VPHCP PRESERVE CONSERVATION ANALYSIS RESULTS

Table A-1: Proposed Project
Table A-2: Alternative 1 (Baseline)
Table A-3: Alternative 2 (Expanded Conservation)

Table A-1: VPHCP Preserve Proposed Project Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AM	AN
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
3	B 11	Mesa Norte	North	Inside	100	44	0	44	44	0	44	0.60	0.60	0.00	0.60	None	0	0	12	12	0	0	10	10	0	0	0	0	24	24	None identified	None identified
4	B 5	Tierra Alta	North	Inside	100	1	0	1	1	0	1	0.01	0.01	0.00	0.01	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
5	B 7-8	Crescent Heights	North	Inside	100	7	7	0	7	7	0	0.04	0.04	0.04	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
6		Lopez Ridge (City)	North	Inside	94	2	2	0	2	2	0	0.18	0.17	0.17	0.00	SDFS	0	0	2	1.9	0	0	0	0	0	0	0	0	0	0	None identified	None identified
7				Inside	100	8	8	0	8	8	0	0.19	0.19	0.19	0.00	SDFS	0	0	8	8	0	0	1	1	0	0	0	0	2	2	None identified	None identified
8	C 17-18	Fieldstone	North	Inside	100	9	0	9	9	0	9	0.32	0.32	0.00	0.32	None	0	0	8	8	0	0	0	0	0	0	0	0	0	0	None identified	None identified
9	C 27	Mira Mesa Market Center	North	Inside	100	1	0	1	1	0	1	0.06	0.06	0.00	0.06	None	0	0	1	1	0	0	0	0	0	0	0	0	1	1	None identified	None identified
10	D 5-8	Carroll Canyon	North	Inside	75	4	4	0	3	3	0	0.01	0.01	0.01	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
11				Inside	100	115	115	0	115	115	0	1.17	1.17	1.17	0.00	SDFS, NAFO	0	0	42	42	1	1	65	65	0	0	0	0	5	5	ERAR, POAB	None identified
12		Parkdale Carroll Canyon	North	Inside	100	4	4	0	4	4	0	0.02	0.02	0.02	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
13	F 16-17	Menlo KM Parcel	Central	Inside	75	14	0	14	11	0	11	0.19	0.14	0.00	0.14	None	0	0	0	0	0	0	0	0	0	0	0	0	1	0.75	ERAR, POAB, SDFS	None identified
14	H 1-10, 13-15, 18-26	Del Mar Mesa (City/County)	North	Inside	100	92	92	0	92	92	0	0.54	0.54	0.54	0.00	SDFS	0	0	3	3	0	0	49	49	0	0	0	0	8	8	ERAR, POAB, SDFS	ERAR, POAB
15		Del Mar Mesa (Private)	North	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS	0	0	0	0	0	0	2	1.5	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
16			North	Inside	100	3	0	3	3	0	3	0.26	0.26	0.00	0.26	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	ERAR, POAB, SDFS	ERAR, POAB
17		Rhodes	North	Outside	0	14	0	14	0	0	0	0.09	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
18			North	Inside	100	142	0	142	142	0	142	0.69	0.69	0.00	0.69	SDFS	0	0	7	7	0	0	6	6	0	0	0	0	4	4	ERAR, POAB, SDFS	ERAR, POAB
19	H 17	Shaw Lorenz	North	Inside	100	28	0	28	28	0	28	0.24	0.24	0.00	0.24	None	0	0	0	0	0	0	0	0	0	0	0	0	8	8	None identified	None identified
20	H 33	East Ocean Air Drive	North	Inside	100	2	0	2	2	0	2	0.03	0.03	0.00	0.03	None	0	0	0	0	0	0	2	2	0	0	0	0	0	0	ERAR, POAB, SDFS	None identified
21	H 38	Carmel Mountain	North	Inside	100	64	64	0	64	64	0	0.61	0.61	0.61	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	2	2	None identified	None identified
22	H 39	Greystone Torrey Highlands	North	Inside	100	19	19	0	19	19	0	0.68	0.68	0.68	0.00	None	0	0	5	5	0	0	3	3	0	0	0	0	0	0	None identified	None identified
23	I 1	Arjons	North	Inside	100	34	0	34	34	0	34	0.73	0.73	0.00	0.73	None	0	0	22	22	0	0	15	15	0	0	0	0	1	1	None identified	ERAR, POAB
24	I 12	Pueblo Lands	North	Outside	0	5	5	0	0	0	0	0.05	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	4	0	None identified	None identified
25			North	Inside	94	2	2	0	2	2	0	0.04	0.03	0.03	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	1.88	None identified	None identified
26	I 6 B	Ford Leasing (Bob Baker)	North	Inside	100	8	0	8	8	0	8	0.08	0.08	0.00	0.08	None	0	0	7	7	0	0	0	0	0	0	0	0	3	3	None identified	ERAR, POAB
27	I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Inside	100	15	0	15	15	0	15	0.24	0.24	0.00	0.24	None	0	0	11	11	0	0	2	2	0	0	0	0	6	6	None identified	ERAR, POAB
28	J 11 E	Slump Block Pools	South	Inside	75	2	0	2	2	0	2	0.63	0.47	0.00	0.47	RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
29	J 11 W	J 11 West	South	Inside	75	5	0	5	4	0	4	0.49	0.37	0.00	0.37	RFS	0	0	0	0	0	0	0	0	0	0	1	0.75	1	0.75	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
30	J 12	J 12	South	Inside	75	5	0	5	4	0	4	0.28	0.21	0.00	0.21	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
31	J 13 E	South Otay J 13 East	South	Outside	0	3	0	3	0	0	0	0.02	0.00	0.00	0.00	SDFS, RFS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
32			South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
33			South	Inside	100	3		3	3	0	3	0.03	0.03	0.00	0.03	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
34	J 13 N	NDU 1 & 2	South	Outside	0	13	13	0	0	0	0	0.07	0.00	0.00	0.00	None	0	0	0	0	1	0	2	0	0	0	0	0	13	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
35		South Otay 1 acre (Private)	South	Outside	0	7	7	0	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
36		South Otay 1 acre (City)	South	Inside	100	17	17	0	17	17	0	0.22	0.22	0.22	0.00	None	0	0	0	0	1	1	1	1	1	1	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Table A-1: VPHCP Preserve Proposed Project Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AM	AN
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
37	J 13 S	NDU 1 & 2	South	Outside	0	4	4	0	0	0	0	0.21	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
38		South Otay J 13 South	South	Outside	0	13	0	13	0	0	0	0.09	0.00	0.00	0.00	None	0	0	0	0	0	0	1	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
39		Bachman	South	Inside	100	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
40		South Otay J 13 South	South	Inside	75	10	0	10	8	0	8	0.06	0.04	0.00	0.04	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
41				Inside	100	16	0	16	16	0	16	0.43	0.43	0.00	0.43	SDFS, NAFO	0	0	0	0	0	0	6	6	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
42	J 14	Brown Field Basins	South	Outside	0	4	0	4	0	0	0	0.83	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
43		Anderprises (City)	South	Inside	100	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
44		Bachman	South	Inside	75	2	0	2	2	0	2	0.02	0.02	0.00	0.02	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
45		Cal Terraces (South)	South	Inside	100	73	73	0	73	73	0	1.45	1.45	1.45	0.00	RFS, SDFS, NAFO	63	63	0	0	6	6	55	55	5	5	26	26	32	32	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
46		Handler	South	Inside	100	24	0	24	24	0	24	0.07	0.07	0.00	0.07	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
47	J 16-18	Goat Mesa (City)	South	Inside	100	15	15	0	15	15	0	0.34	0.34	0.34	0.00	RFS, SDFS	0	0	0	0	0	0	4	4	0	0	1	1	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
48		Goat Mesa (Private)	South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
49		Wruck Canyon	South	Inside	100	6	6	0	6	6	0	0.02	0.02	0.02	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
50	J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	Inside	100	304	304	0	304	304	0	3.53	3.53	3.53	0.00	RFS, SDFS, NAFO	286	286	0	0	79	79	275	275	52	52	93	93	209	209	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
51		Clayton Parcel	South	Inside	100	35	35	0	35	35	0	0.27	0.27	0.27	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	1	1	0	0	0	0	2	2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
52		St. Jerome's	South	Outside	0	6	0	6	0	0	0	0.23	0.00	0.00	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
53			South	Inside	100	18	0	18	18	0	18	0.18	0.18	0.00	0.18	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	3	3	1	1	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
54	J 20-21	La Media ITS	South	Inside	75	33	0	33	25	0	25	1.43	1.07	0.00	1.07	None	0	0	0	0	0	0	0	0	0	0	0	0	6	4.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
55	J 21	La Media Swale South	South	Inside	100	7	0	7	7	0	7	0.21	0.21	0.00	0.21	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
56	J 27	Empire Center	South	Inside	100	10	0	10	10	0	10	0.23	0.23	0.00	0.23	None	0	0	0	0	0	0	9	9	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
57	J 28 E	La Media Swale North	South	Inside	75	5	0	5	4	0	4	0.16	0.12	0.00	0.12	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
58	J 31	Hidden Trails	South	Inside	100	66	0	66	66	0	66	0.66	0.66	0.00	0.66	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
59	J 32	West Otay B	South	Inside	100	15	15	0	15	15	0	0.06	0.06	0.06	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
60		West Otay C	South	Inside	100	7	7	0	7	7	0	0.04	0.04	0.04	0.00	NAFO	0	0	0	0	0	0	1	1	0	0	0	0	0	0	None identified	None identified

Table A-1: VPHCP Preserve Proposed Project Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AM	AN
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
61	J 34	Bachman	South	Outside	0	10	0	10	0	0	0	0.06	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
62			South	Inside	75	2	0	2	2	0	2	0.02	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
63			South	Inside	100	3	0	3	3	0	3	0.01	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
64		Candlelight	South	Outside	0	18	0	18	0	0	0	0.38	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	1	0	15	0	None identified	None identified
65			South	Inside	100	9	0	9	9	0	9	0.02	0.02	0.00	0.02	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	1	1	0	0	None identified	None identified
66	J 35	Brown Field	South	Outside	0	25	25	0	0	0	0	3.01	0.00	0.00	0.00	None	0	0	0	0	0	0	1	0	0	0	0	0	3	0	None identified	None identified
67			South	Inside	94	1	1	0	1	1	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
68			South	Inside	100	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
69	J 36	Southview	South	Inside	75	7	0	7	5	0	5	0.04	0.03	0.00	0.03	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	12	9	None identified	None identified
70			South	Inside	75	10		10	8	0	8	0.07	0.05	0.00	0.05	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
71	J 4-5	California Crossing	South	Inside	100	11	0	11	11	0	11	0.09	0.09	0.00	0.09	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
72		Robinhood Ridge	South	Inside	100	83	83	0	83	83	0	0.56	0.56	0.56	0.00	RFS, SDFS, NAFO	19	19	0	0	4	4	46	46	0	0	6	6	41	41	None identified	None identified
73	K 5	Otay Lakes	Central	Inside	100	85	85	0	85	85	0	3.20	3.20	3.20	0.00	SDFS, NAFO	0	0	0	0	2	2	46	46	0	0	0	0	6	6	ERAR, NAFO	None identified
74	KK 1	Lake Murray	Central	Outside	0	1	1	0	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
75	KK 2	Pasatiempo	Central	Inside	75	10	10	0	8	8	0	0.04	0.03	0.03	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
76	MM 1	Marron Valley	South	Inside	100	18	18	0	18	18	0	0.18	0.18	0.18	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
77	N 1-4	Teledyne Ryan	Central	Inside	75	43	0	43	32	0	32	0.59	0.44	0.00	0.44	None	0	0	1	0.8	0	0	0	0	0	0	0	0	11	8.3	POAB, NAFO, SDFS	None identified
78	N 5-6	Montgomery Field	Central	Outside	0	13	13	0	0	0	0	1.67	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	7	0	POAB, NAFO, SDFS	None identified
79			Central	Inside	94	226	226	0	212	212	0	5.46	5.13	5.13	0.00	SDFS, NAFO	0	0	129	121.3	0	0	0	0	0	0	0	0	10	9.4	POAB, NAFO, SDFS	None identified
80			Central	Inside	75	20	20	0	15	15	0	0.25	0.18	0.18	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
81			Central	Inside	100	23	23	0	23	23	0	0.98	0.98	0.98	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
82	N 7	Serra Mesa Library	Central	Inside	100	26	26	0	26	26	0	0.41	0.41	0.41	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
83	N 8	General Dynamics	Central	Inside	100	22	0	22	22	0	22	0.40	0.40	0.00	0.40	None	0	0	20	20	0	0	2	2	0	0	0	0	6	6	None identified	None identified
84	NC	Kelton	South	Inside	100	2	2	0	2	2	0	0.04	0.04	0.04	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
85		Li Collins	North	Inside	100	3	0	3	3	0	3	0.02	0.02	0.00	0.02	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
86	OO	Salk Institute	North	Inside	100	15	0	15	15	0	15	0.09	0.09	0.00	0.09	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
87	Q2	Mission Trails Regional Park	Central	Inside	100	17	17	0	17	17	0	0.25	0.25	0.25	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	6	6	None identified	None identified
88	Q 3	Castlerock	North	Outside	0	4	0	4	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	4	0	None identified	None identified
89			North	Inside	100	5	0	5	5	0	5	0.02	0.02	0.00	0.02	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
90	QQ	Tecolote Canyon	Central	Inside	94	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
91			Central	Inside	100	7	7	0	7	7	0	0.08	0.08	0.08	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
92	R 1	Proctor Valley	South	Inside	100	124	124	0	124	124	0	1.40	1.40	1.40	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	3	3	ERAR, NAFO	None identified
93	U 15	SANDER	Central	Outside	0	1	1	0	0	0	0	0.34	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
94			Central	Inside	75	38	38	0	29	29	0	0.49	0.37	0.37	0.00	SDFS	0	0	1	0.8	0	0	0	0	0	0	0	0	2	1.5	None identified	ERAR, POAB, ORCA, SDFS
95	U 19	Cubic	Central	Outside	0	5	0	5	0	0	0	0.03	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
96			Central	Inside	75	23	0	23	17	0	17	0.37	0.28	0.00	0.28	SDFS	0	0	1	0.8	0	0	2	1.5	0	0	0	0	6	4.5	None identified	ERAR, POAB, ORCA, SDFS
97			Central	Inside	100	1	0	1	1	0	1	0.05	0.05	0.00	0.05	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	ERAR, POAB, ORCA, SDFS
98	X 5	Nobel Drive	North	Inside	100	11	11	0	11	11	0	0.10	0.10	0.10	0.00	NAFO	0	0	0	0	1	1	0	0	0	0	0	0	6	6	SDFS	None identified
99	X 7	Nobel Research	North	Inside	100	28	0	28	28	0	28	0.1	0.1	0.0	0.1	None	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
100				**Total[1]**	**2329**	**1555**	**774**					**40.3**				**Total[1]**	**368**	**-**	**280**	**-**	**95**	**-**	**608**	**-**	**58**	**-**	**132**	**-**	**491**	**-**		
101				**Total Inside Preserve[1]**	**2183**	**1486**	**697**	**2109**	**1454**	**655**	**33.1**	**31.5**	**22.3**	**9.1**	**Total Inside Preserve[1]**		**368**		**271**		**94**		**602**		**58**		**131**		**432**			
102																**% Occupied Pools Conserved[1]**		**100%**		**97%**		**99%**		**99%**		**100%**		**99%**		**88%**		

= Land not owned by City of San Diego.

*= Based on Conservation Level

**= Critical habitat is designated by USFWS for San Diego fairy shrimp (SDFS) and spreading navarretia (NAFO), and proposed for Riverside fairy shrimp (RFS).

[1] On Land Subject to City Jurisdiction

[2] Based on Recovery Plan (USFWS 1998)

PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table A-2: VPHCP Preserve Alternative 1 (Baseline) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
3	B 11	Mesa Norte	North	Inside	100	44	0	44	44	0	44	0.60	0.60	0.00	0.60	None	0	0	12	12	0	0	10	10	0	0	0	0	24	24	None identified	None identified
4	B 5	Tierra Alta	North	Outside	0	1	0	1	0	0	0	0.01	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
5	B 7-8	Crescent Heights	North	Outside	0	7	7	0	0	0	0	0.04	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
6		Lopez Ridge (City)	North	Inside	94	2	2	0	2	2	0	0.18	0.17	0.17	0.00	SDFS	0	0	2	1.9	0	0	0	0	0	0	0	0	0	0	None identified	None identified
7				Inside	100	8	8	0	8	8	0	0.19	0.19	0.19	0.00	SDFS	0	0	8	8	0	0	1	1	0	0	0	0	2	2	None identified	None identified
8	C 17-18	Fieldstone	North	Inside	100	9	0	9	9	0	9	0.32	0.32	0.00	0.32	None	0	0	8	8	0	0	0	0	0	0	0	0	0	0	None identified	None identified
9	C 27	Mira Mesa Market Center	North	Outside	0	1	0	1	0	0	0	0.06	0.00	0.00	0.00	None	0	0	1	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
10	D 5-8	Carroll Canyon	North	Inside	75	4	4	0	3	3	0	0.01	0.01	0.01	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
11				Inside	100	115	115	0	115	115	0	1.17	1.17	1.17	0.00	SDFS, NAFO	0	0	42	42	1	1	65	65	0	0	0	0	5	5	ERAR, POAB	None identified
12		Parkdale Carroll Canyon	North	Inside	100	4	4	0	4	4	0	0.02	0.02	0.02	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
13	F 16-17	Menlo KM Parcel	Central	Outside	0	14	0	14	0	0	0	0.19	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	1	0	ERAR, POAB, SDFS	None identified
14	H 1-10, 13-15, 18-26	Del Mar Mesa (City/County)	North	Inside	100	92	92	0	92	92	0	0.54	0.54	0.54	0.00	SDFS	0	0	3	3	0	0	49	49	0	0	0	0	8	8	ERAR, POAB, SDFS	ERAR, POAB
15		Del Mar Mesa (Private)	North	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS	0	0	0	0	0	0	2	1.5	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
16			North	Inside	100	3	0	3	3	0	3	0.26	0.26	0.00	0.26	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	ERAR, POAB, SDFS	ERAR, POAB
17			North	Outside	0	14	0	14	0	0	0	0.09	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
18		Rhodes	North	Outside	0	142	0	142	0	0	0	0.69	0.00	0.00	0.00	SDFS	0	0	7	0	0	0	6	0	0	0	0	0	4	0	ERAR, POAB, SDFS	ERAR, POAB
19	H 17	Shaw Lorenz	North	Inside	100	28	0	28	28	0	28	0.24	0.24	0.00	0.24	None	0	0	0	0	0	0	0	0	0	0	0	0	8	8	None identified	None identified
20	H 33	East Ocean Air Drive	North	Outside	0	2	0	2	0	0	0	0.03	0.00	0.00	0.00	None	0	0	0	0	0	0	2	0	0	0	0	0	0	0	ERAR, POAB, SDFS	None identified
21	H 38	Carmel Mountain	North	Inside	100	64	64	0	64	64	0	0.61	0.61	0.61	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	2	2	None identified	None identified
22	H 39	Greystone Torrey Highlands	North	Inside	100	19	19	0	19	19	0	0.68	0.68	0.68	0.00	None	0	0	5	5	0	0	3	3	0	0	0	0	0	0	None identified	None identified
23	I 1	Arjons	North	Outside	0	34	0	34	0	0	0	0.73	0.00	0.00	0.00	None	0	0	22	0	0	0	15	0	0	0	0	0	1	0	None identified	ERAR, POAB
24	I 12	Pueblo Lands	North	Outside	0	5	5	0	0	0	0	0.05	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	4	0	None identified	None identified
25			North	Inside	94	2	2	0	2	2	0	0.04	0.03	0.03	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	1.88	None identified	None identified
26	I 6 B	Ford Leasing (Bob Baker)	North	Outside	0	8	0	8	0	0	0	0.08	0.00	0.00	0.00	None	0	0	7	0	0	0	0	0	0	0	0	0	3	0	None identified	ERAR, POAB
27	I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Outside	0	15	0	15	0	0	0	0.24	0.00	0.00	0.00	None	0	0	11	0	0	0	2	0	0	0	0	0	6	0	None identified	ERAR, POAB
28	J 11 E	Slump Block Pools	South	Inside	75	2	0	2	2	0	2	0.63	0.47	0.00	0.47	RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
29	J 11 W	J 11 West	South	Inside	75	5	0	5	4	0	4	0.49	0.37	0.00	0.37	RFS	0	0	0	0	0	0	0	0	0	0	1	0.75	1	0.75	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
30	J 12	J 12	South	Inside	75	5	0	5	4	0	4	0.28	0.21	0.00	0.21	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
31	J 13 E	South Otay J 13 East	South	Outside	0	3	0	3	0	0	0	0.02	0.00	0.00	0.00	SDFS, RFS	0	0	0	0	0	0	1	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
32			South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
33			South	Outside	0	3		3	0	0	0	0.03	0.00	0.00	0.00	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
34	J 13 N	NDU 1 & 2	South	Outside	0	13	13	0	0	0	0	0.07	0.00	0.00	0.00	None	0	0	0	0	1	0	2	0	0	0	0	0	13	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
35		South Otay 1 acre (Private)	South	Outside	0	7	7	0	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
36		South Otay 1 acre (City)	South	Inside	100	17	17	0	17	17	0	0.22	0.22	0.22	0.00	None	0	0	0	0	1	1	1	1	1	1	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Table A-2: VPHCP Preserve Alternative 1 (Baseline) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
37	J 13 S	NDU 1 & 2	South	Outside	0	4	4	0	0	0	0	0.21	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
38		South Otay J 13 South	South	Outside	0	13	0	13	0	0	0	0.09	0.00	0.00	0.00	None	0	0	0	0	0	0	1	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
39		Bachman	South	Outside	0	2	0	2	0	0	0	0.01	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
40		South Otay J 13 South	South	Outside	0	10	0	10	0	0	0	0.06	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
41				Outside	0	16	0	16	0	0	0	0.43	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	6	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
42	J 14	Brown Field Basins	South	Outside	0	4	0	4	0	0	0	0.83	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
43		Anderprises (City)	South	Inside	100	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
44		Bachman	South	Inside	75	2	0	2	2	0	2	0.02	0.02	0.00	0.02	RSF, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
45		Cal Terraces (South)	South	Inside	100	73	73	0	73	73	0	1.45	1.45	1.45	0.00	RSF, SDFS, NAFO	63	63	0	0	6	6	55	55	5	5	26	26	32	32	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
46		Handler	South	Outside	0	24	0	24	0	0	0	0.07	0.00	0.00	0.00	RSF, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
47	J 16-18	Goat Mesa (City)	South	Inside	100	15	15	0	15	15	0	0.34	0.34	0.34	0.00	RFS, SDFS	0	0	0	0	0	0	4	4	0	0	1	1	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
48		Goat Mesa (Private)	South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
49		Wruck Canyon	South	Inside	100	6	6	0	6	6	0	0.02	0.02	0.02	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
50	J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	Inside	100	304	304	0	304	304	0	3.53	3.53	3.53	0.00	RFS, SDFS, NAFO	286	286	0	0	79	79	275	275	52	52	93	93	209	209	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
51		Clayton Parcel	South	Inside	100	35	35	0	35	35	0	0.27	0.27	0.27	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	1	1	0	0	0	0	2	2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
52		St. Jerome's	South	Outside	0	6	0	6	0	0	0	0.23	0.00	0.00	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
53			South	Outside	0	18	0	18	0	0	0	0.18	0.00	0.00	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
54	J 20-21	La Media ITS	South	Outside	0	33	0	33	0	0	0	1.43	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	6	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
55	J 21	La Media Swale South	South	Outside	0	7	0	7	0	0	0	0.21	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
56	J 27	Empire Center	South	Inside	100	10	0	10	10	0	10	0.23	0.23	0.00	0.23	None	0	0	0	0	0	0	9	9	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
57	J 28 E	La Media Swale North	South	Inside	75	5	0	5	4	0	4	0.16	0.12	0.00	0.12	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
58	J 31	Hidden Trails	South	Inside	100	66	0	66	66	0	66	0.66	0.66	0.00	0.66	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified

Table A-2: VPHCP Preserve Alternative 1 (Baseline) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
59	J 32	West Otay B	South	Inside	100	15	15	0	15	15	0	0.06	0.06	0.06	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
60		West Otay C	South	Inside	100	7	7	0	7	7	0	0.04	0.04	0.04	0.00	NAFO	0	0	0	0	0	0	1	1	0	0	0	0	0	0	None identified	None identified
61	J 34	Bachman	South	Outside	0	10	0	10	0	0	0	0.06	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
62			South	Inside	75	2	0	2	2	0	2	0.02	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
63			South	Outside	0	3	0	3	0	0	0	0.01	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
64		Candlelight	South	Outside	0	18	0	18	0	0	0	0.38	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	1	0	15	0	None identified	None identified
65			South	Outside	0	9	0	9	0	0	0	0.02	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	None identified	None identified
66	J 35	Brown Field	South	Outside	0	25	25	0	0	0	0	3.01	0.00	0.00	0.00	None	0	0	0	0	0	0	1	0	0	0	0	0	3	0	None identified	None identified
67			South	Inside	94	1	1	0	1	1	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
68			South	Outside	0	2	2	0	0	0	0	0.01	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
69	J 36	Southview	South	Inside	75	7	0	7	5	0	5	0.04	0.03	0.00	0.03	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	3.75	None identified	None identified
70			South	Outside	0	10		10	0	0	0	0.07	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	7	0	None identified	None identified
71	J 4-5	California Crossing	South	Inside	100	11	0	11	11	0	11	0.09	0.09	0.00	0.09	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
72		Robinhood Ridge	South	Inside	100	83	83	0	83	83	0	0.56	0.56	0.56	0.00	RFS, SDFS, NAFO	19	19	0	0	4	4	46	46	0	0	6	6	41	41	None identified	None identified
73	K 5	Otay Lakes	Central	Inside	100	85	85	0	85	85	0	3.20	3.20	3.20	0.00	SDFS, NAFO	0	0	0	0	2	2	46	46	0	0	0	0	6	6	ERAR, NAFO	None identified
74	KK 1	Lake Murray	Central	Outside	0	1	1	0	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
75	KK 2	Pasatiempo	Central	Outside	0	10	10	0	0	0	0	0.04	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
76	MM 1	Marron Valley	South	Inside	100	18	18	0	18	18	0	0.18	0.18	0.18	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
77	N 1-4	Teledyne Ryan	Central	Outside	0	43	0	43	0	0	0	0.59	0.00	0.00	0.00	None	0	0	1	0	0	0	0	0	0	0	0	0	11	0	POAB, NAFO, SDFS	None identified
78	N 5-6	Montgomery Field	Central	Outside	0	13	13	0	0	0	0	1.67	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	7	0	POAB, NAFO, SDFS	None identified
79			Central	Inside	94	226	226	0	212	212	0	5.46	5.13	5.13	0.00	SDFS, NAFO	0	0	129	121.3	0	0	0	0	0	0	0	0	10	9.4	POAB, NAFO, SDFS	None identified
80			Central	Outside	0	20	20	0	0	0	0	0.25	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
81			Central	Outside	0	23	23	0	0	0	0	0.98	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
82	N 7	Serra Mesa Library	Central	Inside	100	26	26	0	26	26	0	0.41	0.41	0.41	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
83	N 8	General Dynamics	Central	Inside	100	22	0	22	22	0	22	0.40	0.40	0.00	0.40	None	0	0	20	20	0	0	2	2	0	0	0	0	6	6	None identified	None identified
84	NC	Kelton	South	Inside	100	3	3	0	3	3	0	0.04	0.04	0.04	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
85		Li Collins	North	Inside	100	2	0	2	2	0	2	0.02	0.02	0.00	0.02	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
86	OO	Salk Institute	North	Outside	0	15	0	15	0	0	0	0.09	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
87	Q2	Mission Trails Regional Park	Central	Inside	100	17	17	0	17	17	0	0.25	0.25	0.25	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	6	6	None identified	None identified
88	Q 3	Castlerock	North	Outside	0	4	0	4	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	4	0	None identified	None identified
89			North	Outside	0	5	0	5	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
90	QQ	Tecolote Canyon	Central	Inside	94	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
91			Central	Inside	100	7	7	0	7	7	0	0.08	0.08	0.08	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
92	R 1	Proctor Valley	South	Inside	100	124	124	0	124	124	0	1.40	1.40	1.40	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	3	3	ERAR, NAFO	None identified
93	U 15	SANDER	Central	Outside	0	1	1	0	0	0	0	0.34	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
94			Central	Outside	0	38	38	0	0	0	0	0.49	0.00	0.00	0.00	SDFS	0	0	1	0	0	0	0	0	0	0	0	0	2	0	None identified	ERAR, POAB, ORCA, SDFS
95	U 19	Cubic	Central	Outside	0	5	0	5	0	0	0	0.03	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
96			Central	Outside	0	23	0	23	0	0	0	0.37	0.00	0.00	0.00	SDFS	0	0	1	0	0	0	2	0	0	0	0	0	6	0	None identified	ERAR, POAB, ORCA, SDFS
97			Central	Outside	0	1	0	1	0	0	0	0.05	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	ERAR, POAB, ORCA, SDFS
98	X 5	Nobel Drive	North	Inside	100	11	11	0	11	11	0	0.10	0.10	0.10	0.00	NAFO	0	0	0	0	1	1	0	0	0	0	0	0	6	6	SDFS	None identified
99	X 7	Nobel Research	North	Inside	100	28	0	28	28	0	28	0.10	0.10	0.00	0.10	None	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
100				**Total[1]**	**2329**	**1556**	**773**					**40.3**				**Total[1]**	**368**	-	**280**	-	**95**	-	**608**	-	**58**	-	**132**	-	**491**	-		
101				**Total Inside Preserve[1]**	**1644**	**1387**	**257**	**1621**	**1372**	**249**	**25.7**	**24.9**	**20.7**	**4.2**	**Total Inside Preserve1**		**368**		**221**		**94**		**570**		**58**		**127**		**389**			
102																**% Occupied Pools Conserved[1]**		**100%**		**79%**		**99%**		**94%**		**100%**		**96%**		**79%**			

103 = Land not owned by City of San Diego.

104 *= Based on Conservation Level

105 **= Critical habitat is designated by USFWS for San Diego fairy shrimp (SDFS) and spreading navarretia (NAFO), and proposed for Riverside fairy shrimp (RFS).

106 [1]On Land Subject to City Jurisdiction

107 [2]Based on Recovery Plan (USFWS 1998)

108 PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp

Table A-3 VPHCP Preserve Alternative 2 (Expanded) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
3	B 11	Mesa Norte	North	Inside	100	44	0	44	44	0	44	0.60	0.60	0.00	0.60	None	0	0	12	12	0	0	10	10	0	0	0	0	24	24	None identified	None identified
4	B 5	Tierra Alta	North	Inside	100	1	0	1	1	0	1	0.01	0.01	0.00	0.01	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
5	B 7-8	Crescent Heights	North	Inside	100	7	7	0	7	7	0	0.04	0.04	0.04	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
6		Lopez Ridge (City)	North	Inside	94	2	2	0	2	2	0	0.18	0.17	0.17	0.00	SDFS	0	0	2	1.9	0	0	0	0	0	0	0	0	0	0	None identified	None identified
7				Inside	100	8	8	0	8	8	0	0.19	0.19	0.19	0.00	SDFS	0	0	8	8	0	0	1	1	0	0	0	0	2	2	None identified	None identified
8	C 17-18	Fieldstone	North	Inside	100	9	0	9	9	0	9	0.32	0.32	0.00	0.32	None	0	0	8	8	0	0	0	0	0	0	0	0	0	0	None identified	None identified
9	C 27	Mira Mesa Market Center	North	Inside	100	1	0	1	1	0	1	0.06	0.06	0.00	0.06	None	0	0	1	1	0	0	0	0	0	0	0	0	1	1	None identified	None identified
10	D 5-8	Carroll Canyon	North	Inside	75	4	4	0	3	3	0	0.01	0.01	0.01	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
11				Inside	100	115	115	0	115	115	0	1.17	1.17	1.17	0.00	SDFS, NAFO	0	0	42	42	1	1	65	65	0	0	0	0	5	5	ERAR, POAB	None identified
12		Parkdale Carroll Canyon	North	Inside	100	4	4	0	4	4	0	0.02	0.02	0.02	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB	None identified
13	F 16-17	Menlo KM Parcel	Central	Inside	75	14	0	14	11	0	11	0.19	0.14	0.00	0.14	None	0	0	0	0	0	0	0	0	0	0	0	0	1	0.75	ERAR, POAB, SDFS	None identified
14	H 1-10, 13-15, 18-26	Del Mar Mesa (City/County)	North	Inside	100	92	92	0	92	92	0	0.54	0.54	0.54	0.00	SDFS	0	0	3	3	0	0	49	49	0	0	0	0	8	8	ERAR, POAB, SDFS	ERAR, POAB
15		Del Mar Mesa (Private)	North	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS	0	0	0	0	0	0	2	1.5	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
16			North	Inside	100	3	0	3	3	0	3	0.26	0.26	0.00	0.26	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	ERAR, POAB, SDFS	ERAR, POAB
17			North	Outside	0	7	0	7	0	0	0	0.05	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
18			North	Inside	100	7	0	7	7	0	7	0.04	0.04	0.00	0.04	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, POAB, SDFS	ERAR, POAB
19		Rhodes	North	Inside	100	142	0	142	142	0	142	0.69	0.69	0.00	0.69	SDFS	0	0	7	7	0	0	6	6	0	0	0	0	4	4	ERAR, POAB, SDFS	ERAR, POAB
20	H 17	Shaw Lorenz	North	Inside	100	28	0	28	28	0	28	0.24	0.24	0.00	0.24	None	0	0	0	0	0	0	0	0	0	0	0	0	8	8	None identified	None identified
21	H 33	East Ocean Air Drive	North	Inside	100	2	0	2	2	0	2	0.03	0.03	0.00	0.03	None	0	0	0	0	0	0	2	2	0	0	0	0	0	0	ERAR, POAB, SDFS	None identified
22	H 38	Carmel Mountain	North	Inside	100	64	64	0	64	64	0	0.61	0.61	0.61	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	2	2	None identified	None identified
23	H 39	Greystone Torrey Highlands	North	Inside	100	19	19	0	19	19	0	0.68	0.68	0.68	0.00	None	0	0	5	5	0	0	3	3	0	0	0	0	0	0	None identified	None identified
24	I 1	Arjons	North	Inside	100	34	0	34	34	0	34	0.73	0.73	0.00	0.73	None	0	0	22	22	0	0	15	15	0	0	0	0	1	1	None identified	ERAR, POAB
25	I 12	Pueblo Lands	North	Outside	0	1	1	0	0	0	0	0.03	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
26			North	Inside	75	4	4	0	3	3	0	0.02	0.02	0.02	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	3	2.25	None identified	None identified
27			North	Inside	94	2	2	0	2	2	0	0.04	0.03	0.03	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	1.88	None identified	None identified
28	I 6 B	Ford Leasing (Bob Baker)	North	Inside	100	8	0	8	8	0	8	0.08	0.08	0.00	0.08	None	0	0	7	7	0	0	0	0	0	0	0	0	3	3	None identified	ERAR, POAB
29	I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Inside	100	15	0	15	15	0	15	0.24	0.24	0.00	0.24	None	0	0	11	11	0	0	2	2	0	0	0	0	6	6	None identified	ERAR, POAB
30	J 11 E	Slump Block Pools	South	Inside	75	2	0	2	2	0	2	0.63	0.47	0.00	0.47	RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
31	J 11 W	J 11 West	South	Inside	75	5	0	5	4	0	4	0.49	0.37	0.00	0.37	RFS	0	0	0	0	0	0	0	0	0	0	1	0.75	1	0.75	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
32	J 12	J 12	South	Inside	75	5	0	5	4	0	4	0.28	0.21	0.00	0.21	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Table A-3 VPHCP Preserve Alternative 2 (Expanded) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
33	J 13 E	South Otay J 13 East	South	Inside	75	3	0	3	2	0	2	0.02	0.02	0.00	0.02	SDFS, RFS	0	0	0	0	0	0	1	0.75	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
34			South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
35			South	Inside	100	3		3	3	0	3	0.03	0.03	0.00	0.03	SDFS, RFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
36	J 13 N	NDU 1 & 2	South	Outside	0	13	13	0	0	0	0	0.07	0.00	0.00	0.00	None	0	0	0	0	1	0	2	0	0	0	0	0	13	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
37		South Otay 1 acre (Private)	South	Outside	0	1	1	0	0	0	0	0.01	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
38		South Otay 1 acre (Private)	South	Inside	75	6	6	0	0	5	0	0.02	0.02	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
39		South Otay 1 acre (City)	South	Inside	100	17	17	0	17	17	0	0.22	0.22	0.22	0.00	None	0	0	0	0	1	1	1	1	1	1	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
40	J 13 S	NDU 1 & 2	South	Outside	0	4	4	0	0	0	0	0.21	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	2	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
41		Bachman	South	Inside	100	2	0	2	2	0	2	0.01	0.01	0.00	0.01	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
42		South Otay J 13 South	South	Outside	0	2	0	2	0	0	0	0.01	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
43			South	Inside	75	11	0	11	8	0	8	0.09	0.07	0.00	0.07	None	0	0	0	0	0	0	1	0.75	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
44			South	Inside	75	10	0	10	8	0	8	0.06	0.04	0.00	0.04	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
45			South	Inside	100	16	0	16	16	0	16	0.43	0.43	0.00	0.43	SDFS, NAFO	0	0	0	0	0	0	6	6	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
46	J 14	Brown Field Basins	South	Inside	75	3	0	3	2	0	2	0.83	0.62	0.00	0.62	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
47			South	Inside	100	1	0	1	1	0	1	0.01	0.01	0.00	0.01	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
48		Anderprises (City)	South	Inside	100	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
49		Bachman	South	Inside	75	2	0	2	2	0	2	0.02	0.02	0.00	0.02	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
50		Cal Terraces (South)	South	Inside	100	73	73	0	73	73	0	1.45	1.45	1.45	0.00	RFS, SDFS, NAFO	63	63	0	0	6	6	55	55	5	5	26	26	32	32	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
51		Handler	South	Inside	100	24	0	24	24	0	24	0.07	0.07	0.00	0.07	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
52	J 16-18	Goat Mesa (City)	South	Inside	100	15	15	0	15	15	0	0.34	0.34	0.34	0.00	RFS, SDFS	0	0	0	0	0	0	4	4	0	0	1	1	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
53		Goat Mesa (Private)	South	Inside	75	2	0	2	2	0	2	0.01	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
54		Wruck Canyon	South	Inside	100	6	6	0	6	6	0	0.02	0.02	0.02	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified

Table A-3 VPHCP Preserve Alternative 2 (Expanded) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
55	J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	Inside	100	304	304	0	304	304	0	3.53	3.53	3.53	0.00	RFS, SDFS, NAFO	286	286	0	0	79	79	275	275	52	52	93	93	209	209	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
56		Clayton Parcel	South	Inside	100	35	35	0	35	35	0	0.27	0.27	0.27	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	1	1	0	0	0	0	2	2	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
57		St. Jerome's	South	Outside	0	6	0	6	0	0	0	0.23	0.00	0.00	0.00	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
58			South	Inside	100	18	0	18	18	0	18	0.18	0.18	0.00	0.18	RFS, SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	3	3	1	1	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
59	J 20-21	La Media ITS	South	Inside	75	33	0	33	25	0	25	1.43	1.07	0.00	1.07	None	0	0	0	0	0	0	0	0	0	0	0	0	6	4.5	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
60	J 21	La Media Swale South	South	Inside	100	7	0	7	7	0	7	0.21	0.21	0.00	0.21	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
61	J 27	Empire Center	South	Inside	100	10	0	10	10	0	10	0.23	0.23	0.00	0.23	None	0	0	0	0	0	0	9	9	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
62	J 28 E	La Media Swale North	South	Inside	75	5	0	5	4	0	4	0.16	0.12	0.00	0.12	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ERAR, PONU ORCA, NAFO, RFS, SDFS	None identified
63	J 31	Hidden Trails	South	Inside	100	66	0	66	66	0	66	0.66	0.66	0.00	0.66	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
64	J 32	West Otay B	South	Inside	100	15	15	0	15	15	0	0.06	0.06	0.06	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
65		West Otay C	South	Inside	100	7	7	0	7	7	0	0.04	0.04	0.04	0.00	NAFO	0	0	0	0	0	0	1	1	0	0	0	0	0	0	None identified	None identified
66	J 34	Bachman	South	Outside	0	10	0	10	0	0	0	0.06	0.00	0.00	0.00	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	0	None identified	None identified
67			South	Inside	75	2	0	2	2	0	2	0.02	0.01	0.00	0.01	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
68			South	Inside	100	3	0	3	3	0	3	0.01	0.01	0.00	0.01		0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
69		Candlelight	South	Outside	0	18	0	18	0	0	0	0.38	0.00	0.00	0.00		0	0	0	0	0	0	0	0	0	0	1	0	15	0	None identified	None identified
70			South	Inside	100	9	0	9	9	0	9	0.02	0.02	0.00	0.02	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	1	1	0	0	None identified	None identified
71	J 35	Brown Field	South	Outside	0	25	25	0	0	0	0	3.01	0.00	0.00	0.00	None	0	0	0	0	0	0	1	0	0	0	0	0	3	0	None identified	None identified
72			South	Inside	94	1	1	0	1	1	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
73			South	Inside	100	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
74	J 36	Southview	South	Inside	75	7	0	7	5	0	5	0.04	0.03	0.00	0.03	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	12	9	None identified	None identified
75			South	Inside	75	10		10	8	0	8	0.07	0.05	0.00	0.05	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
76	J 4-5	California Crossing	South	Inside	100	11	0	11	11	0	11	0.09	0.09	0.00	0.09	RFS, SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
77		Robinhood Ridge	South	Inside	100	83	83	0	83	83	0	0.56	0.56	0.56	0.00	RFS, SDFS, NAFO	19	19	0	0	4	4	46	46	0	0	6	6	41	41	None identified	None identified
78	K 5	Otay Lakes	Central	Inside	100	85	85	0	85	85	0	3.20	3.20	3.20	0.00	SDFS, NAFO	0	0	0	0	2	2	46	46	0	0	0	0	6	6	ERAR, NAFO	None identified
79	KK 1	Lake Murray	Central	Outside	0	1	1	0	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
80	KK 2	Pasatiempo	Central	Inside	75	10	10	0	8	8	0	0.04	0.03	0.03	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
81	MM 1	Marron Valley	South	Inside	100	18	18	0	18	18	0	0.18	0.18	0.18	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	5	5	None identified	None identified
82	N 1-4	Teledyne Ryan	Central	Inside	75	43	0	43	32	0	32	0.59	0.44	0.00	0.44	None	0	0	1	0.8	0	0	0	0	0	0	0	0	11	8.3	POAB, NAFO, SDFS	None identified

Table A-3 VPHCP Preserve Alternative 2 (Expanded) Conservation of Vernal Pools and Focal Species

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AF	AG
1						Total Pools Inside and Outside Preserve[1]											Occupied Focal Species Pools: Total (Inside and Outside Preserve)[1] and Total Conserved in the Preserve*															
2	Complex ID	Name	Geographic Area	INSIDE or OUTSIDE Vernal Pool HCP Preserve (Subject to City Jurisdiction)	Conservation Level (75, 94 or 100% Conserved)	Total	City Controlled	Other Ownership	Total Pools Conserved Inside and Outside Preserve*	Pools Conserved on City Controlled Land Inside and Outside Preserve*	Pools Conserved on Other Ownership Land Inside and Outside Preserve*	Total Surface Area of Pools (Acres)	Surface Area Conserved (Acres)*	Surface Area Conserved on City Controlled Land (Acres)*	Surface Area Conserved on Other Ownership Land (Acres)*	Focal Species Critical Habitat Present**	PONU total	PONU Cons	POAB total	POAB Cons	NAFO total	NAFO Cons	ERAR total	ERAR Cons	ORCA total	ORCA Cons	RFS total	RFS Cons	SDFS total	SDFS Cons	Complex Identified as Necessary to Stabilize the Following Focal Species Populations[2]	Complex Identified as Necessary to Reclassify the Following Focal Species Populations[2]
83	N 5-6	Montgomery Field	Central	Outside	0	13	13	0	0	0	0	1.67	0.00	0.00	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	7	0	POAB, NAFO, SDFS	None identified
84			Central	Inside	94	226	226	0	212	212	0	5.46	5.13	5.13	0.00	SDFS, NAFO	0	0	129	121.3	0	0	0	0	0	0	0	0	10	9.4	POAB, NAFO, SDFS	None identified
85			Central	Inside	75	20	20	0	15	15	0	0.25	0.18	0.18	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
86			Central	Inside	100	23	23	0	23	23	0	0.98	0.98	0.98	0.00	SDFS, NAFO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	POAB, NAFO, SDFS	None identified
87	N 7	Serra Mesa Library	Central	Inside	100	26	26	0	26	26	0	0.41	0.41	0.41	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
88	N 8	General Dynamics	Central	Inside	100	22	0	22	22	0	22	0.40	0.40	0.00	0.40	None	0	0	20	20	0	0	2	2	0	0	0	0	6	6	None identified	None identified
89	NC	Kelton	South	Inside	100	2	2	0	2	2	0	0.04	0.04	0.04	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
90		Li Collins	North	Inside	100	3	0	3	3	0	3	0.02	0.02	0.00	0.02	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
91	OO	Salk Institute	North	Inside	100	15	0	15	15	0	15	0.09	0.09	0.00	0.09	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
92	Q2	Mission Trails Regional Park	Central	Inside	100	17	17	0	17	17	0	0.25	0.25	0.25	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	6	6	None identified	None identified
93	Q 3	Castlerock	North	Outside	0	4	0	4	0	0	0	0.02	0.00	0.00	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	4	0	None identified	None identified
94			North	Inside	100	5	0	5	5	0	5	0.02	0.02	0.00	0.02	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
95	QQ	Tecolote Canyon	Central	Inside	94	2	2	0	2	2	0	0.01	0.01	0.01	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
96			Central	Inside	100	7	7	0	7	7	0	0.08	0.08	0.08	0.00	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	None identified
97	R 1	Proctor Valley	South	Inside	100	124	124	0	124	124	0	1.40	1.40	1.40	0.00	NAFO	0	0	0	0	0	0	0	0	0	0	0	0	3	3	ERAR, NAFO	None identified
98	U 15	SANDER	Central	Outside	0	1	1	0	0	0	0	0.34	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
99			Central	Inside	75	38	38	0	29	29	0	0.49	0.37	0.37	0.00	SDFS	0	0	1	0.8	0	0	0	0	0	0	0	0	2	1.5	None identified	ERAR, POAB, ORCA, SDFS
100	U 19	Cubic	Central	Outside	0	5	0	5	0	0	0	0.03	0.00	0.00	0.00	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	None identified	ERAR, POAB, ORCA, SDFS
101			Central	Inside	75	23	0	23	17	0	17	0.37	0.28	0.00	0.28	SDFS	0	0	1	0.8	0	0	2	1.5	0	0	0	0	6	4.5	None identified	ERAR, POAB, ORCA, SDFS
102			Central	Inside	100	1	0	1	1	0	1	0.05	0.05	0.00	0.05	SDFS	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	ERAR, POAB, ORCA, SDFS
103	X 5	Nobel Drive	North	Inside	100	11	11	0	11	11	0	0.10	0.10	0.10	0.00	NAFO	0	0	0	0	1	1	0	0	0	0	0	0	6	6	SDFS	None identified
104	X 7	Nobel Research	North	Inside	100	28	0	28	28	0	28	0.10	0.10	0.00	0.10	None	0	0	0	0	0	0	0	0	0	0	0	0	1	1	None identified	None identified
105				Total[1]		2329	1555	774				40.3				Total[1]	368	-	280	-	95	-	608	-	58	-	132	-	491	-		
106				Total Inside Preserve[1]		2218	1496	722	2133	1462	676	34.2	32.3	22.4	9.9	Total Inside Preserve1		368		271		94		604		58		131		434			
107																% Occupied Pools Conserved[1]		100%		97%		99%		99%		100%		99%		88%			

108 = Land not owned by City of San Diego.

109 *= Based on Conservation Level

110 **= Critical habitat is designated by USFWS for San Diego fairy shrimp (SDFS) and spreading navarretia (NAFO), and proposed for Riverside fairy shrimp (RFS).

111 [1]On Land Subject to City Jurisdiction

112 [2]Based on Recovery Plan (USFWS 1998)

113 PONU = Otay Mesa mint; POAB = San Diego Mesa mint; NAFO = Spreading navarretia; ERAR = San Diego button-celery; ORCA = California Orcutt grass; RFS = Riverside fairy shrimp; SDFS = San Diego fairy shrimp